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USSR Report

ECONOMIC AFFAIRS



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USSR REPORT ECONOMIC AFFAIRS

CONTENTS

ECONOMIC POLICY, ORGANIZATION AND MANAGEMENT

- Conference on Industrial Economic Analysis Held in Moscow
(V. Drozdova, Ye. Osadchaya; PLANOVVOYE KHOZYAYSTVO,
No 1, Jan 84)..... 1
- Second Optimal Planning Conference Highlighted
(EKONOMIKA I MATEMATICHESKIYE METODY, No 5, Sep-Oct 83)... 4

PLANNING AND PLAN IMPLEMENTATION

- Eleventh Five-Year Plan Reaches Decisive Stage
(Editorial; PLANOVVOYE KHOZYAYSTVO, No 1, Jan 84)..... 21

INVESTMENT, PRICES, BUDGET AND FINANCE

- Industrial Stock, Capital Reserves Formation Examined
(V. Shtundyuk; PLANOVVOYE KHOZYAYSTVO, No 1, Jan 84)..... 30
- Ukrainian Economist Evaluates Investment Variants
(Yu. Kushchevskiy; PLANOVVOYE KHOZYAYSTVO, No 12,
Dec 83)..... 42

INDUSTRIAL DEVELOPMENT AND PERFORMANCE

- Further Strengthening of Interindustrial Ties Urged
(V. Andrianov; PLANOVVOYE KHOZYAYSTVO, No 1, Jan 84)..... 51

RESOURCE UTILIZATION AND SUPPLY

- Resource Reserves in National Economy Discussed
(Ye. V. Gregorzhevskaya; IZVESTIYA AKADEMII NAUK
SSSR - SERIYA EKONOMICHESKAYA, No 6, Nov-Dec 83)..... 56

Lax Approach to Material Conservation Decried (S. Anisimov; MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE, No 12, Dec 83).....	68
Pricing Methodology for Secondary Raw Materials Reviewed (V. Novikov, I. Lipsits; PLANOVOYE KHOZYAYSTVO, No 12, Dec 83).....	79
INTRODUCTION OF NEW TECHNOLOGY	
Economist Traces Impact of Technology on Production (G. Danilin; PLANOVOYE KHOZYAYSTVO, No 1, Jan 84).....	86

ECONOMIC POLICY, ORGANIZATION AND MANAGEMENT

CONFERENCE ON INDUSTRIAL ECONOMIC ANALYSIS HELD IN MOSCOW

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 1, Jan 84 pp 125-126

[Summary by Candidate of Economic Sciences V. Drozdova and Ye. Osadchaya:
"Conference On Perfecting Economic Analysis"]

[Text] The all-union practical scientific conference, "Organization and Methods of Economic Analysis in Industry," was held in Moscow in September 1983. It was attended by prominent officials from the staff of the CPSU Central Committee, the USSR Gosplan, the USSR Ministry of Finance, the USSR State Bank, the All-Union Central Council of Trade Unions, the All-Union Council of Scientific-Technical Societies, the Scientific-Economic Society, associations, ministries and departments, leading scholars in the theory of economic analysis, and scientists and practitioners from all the union republics and from major industrial and scientific centers of the Urals, the Far East, Central Asia and the Caucasus.

The plenary session was opened by Doctor of Economic Sciences V. V. Dementsev, chairman of the Organizational Committee, first deputy minister of finance of the USSR. He examined the main problems of national economic development in the light of the decisions of the 26th CPSU congress and subsequent plenums of the party Central Committee and party and government decisions, and defined the role of economic analysis in their implementation and the objectives and tasks of the conference.

Speakers at the conference stressed the need to enhance the role of analysis in planning and management at the current stage of development of the socialist economy and of making it more comprehensive by studying the technical, organizational and social aspects of economic activity. The conference examined ways of enhancing the impact of analysis on the acceleration of scientific and technical progress. It was pointed out that it has become necessary for economic analysis to expand into socio-economic analysis and that the prerequisites for this exist.

An important factor that can contribute to raising the effectiveness of production is greater participation of work collectives in looking for and tapping ways and means of economizing all types of resources. The greatest participation in this effort can be achieved through Public Bureaus of Economic Analysis. The role of economic analysis in involving the broad masses of the working people in the management of the economic activity of enterprises

and organizations was discussed by Doctor of Economic Sciences N. N. Gritsenko, first deputy chairman of the All-Union Council of Scientific-Technical Societies. The favorable experience of 69 public bureaus of economic analysis at the Uralmash Production Association, which pioneered this movement, was discussed by P. V. Barakovskaya, chairman of the association's council of public bureaus of economic analysis.

Economic analysis should be regarded as an integral component of the whole mechanism of cost accounting, down to the production level. The essential prerequisites for the organization of internal economic analysis are: formation of a system of norms and quotas for the production association or enterprise; extension of factory planning from the basic to auxiliary, service, scientific, design, and managerial processes; introduction of practicable normative accounting.

Several other basic fields to be pursued with the purpose of perfecting the system of economic analysis were suggested, notably, the blending of subsequent analysis with ongoing and preliminary analysis, accelerated development of comparative analysis, and dissemination of functional-cost analysis. Doctor of Economic Sciences B. I. Maydanchik, head of the chair of economic activity analysis at the Moscow Finance Institute, noted that the high rates of scientific and technical progress and changes in the organization of production and management imposed higher demands on economic analysis and the methods of its organization.

Professor A. D. Sheremet, head of the chair of bookkeeping and economic analysis at the Moscow State University, spoke about the experience of scientists in the field of the theory and methods of economic analysis of economic activity and in coordinating the efforts of economists in countries of the socialist community.

Many speakers gave special consideration to analysis of the intensity of plan assignments. In the view of Yu. P. Potemkin, general director of the Moscow Electric Bulb Factory Association, this is of decisive importance during the elaboration of plans. He pointed out the need for justifying plan assignments and coordinating them with the degree of utilization of production potential.

Some speakers examined the specifics of the organization of economic analysis in the finance and credit system on the basis of centralized methodological guidance. They noted the advantages of unification and regulation of analytical work and made a number of fundamental proposals for improving the organization of analytical work. Thus, P. Ya. Pchelin, first deputy chairman of the board of the USSR State Bank, suggested creating a department of analysis methods within the State Bank's economic planning administration and drawing up a program for on-line computerized analysis of bank data on the financial status of economic organizations.

Doctor of Economic Sciences, Professor V. G. Polyanskiy, chief of the economic planning administration of the Ministry of Tractor and Agricultural Machine Building, described the content and organization of analytical work at the ministry level.

The conference participants concluded that it was necessary to set up a nationally regulated system of economic analysis as a prerequisite for raising management standards and enhancing the justification and intensity of plans. Coordination of economic analysis at all administrative levels should be based on unified principles and organizational work taking into account the specific features of the analyzed entities in different industries. In the view of Prof. S. B. Barngol'ts, the establishment of a unified system of analysis should start with the regulation of the content and form of the memorandums accompanying the annual reports of economic agencies, with due account of the specific features of different branches of production economics and organization.

Several contributions considered questions of factorial analysis of labor productivity and pointed out shortcomings in the current system.

Also discussed were questions of perfecting the evaluation and analysis of the fulfillment of plans according to the cost of output and of keeping within established limits of physical expenditures. Some speakers called for changes in the methods of limit setting. They suggested determining the limits of physical expenditure on the basis of direct calculation items, which would simplify accounting according to the cost of products and enhance its reliability. Suggestions were made for improving the mechanism for monitoring the expenditure of wage funds using direct accounting methods based on determination of the labor intensity of manufactured products. The need was noted of developing scientifically substantiated principles of computing assignments for drawing physical assets into the economic turnover. It was suggested that along with assignments for accelerating the turnover rate of working capital, enterprises and associations should be given separate assignments for the absolute reduction of extranormative stocks of physical assets.

Special consideration in the debate was given to problems of management of scientific and technical progress. Many speakers noted the need for closer coordination of plans of technical and organizational development with other planned indices of the operation of associations and ministries, as well as for a realistic assessment of the impact of new technologies on their operations.

Appropriate recommendations were adopted in line with the results of the conference.

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ECONOMIC POLICY, ORGANIZATION AND MANAGEMENT

SECOND OPTIMAL PLANNING CONFERENCE HIGHLIGHTED

Moscow EKONOMIKA I MATEMATICHESKIYE METODY in Russian No 5, Sep-Oct 83 pp 929-938

[Unattributed conference report: "The Second Conference on Optimum National Economic Planning and Management"]

[Text] On 20-22 April 1983, in Moscow the Second Conference on Optimum National Economic Planning and Management was held and this was devoted to the problems of employing mathematical economics methods and computers in optimizing national economic planning and management. It was organized by the Scientific Council of the USSR Academy of Sciences on the interdisciplinary problem "Optimum National Economic Planning and Management" and by the TsEMI [Central Mathematical Economics Institute]. Participating in the conference were around 300 delegates and guests representing the academy and sectorial institutes, VUZes, departments and ministries as well as major associations. The work was conducted in plenary sessions and in six sections.

The plenary session was opened by the Academician Secretary of the Economics Department of the USSR Academy of Sciences and Director of the TsEMI, Academician N. P. Fedorenko. He pointed out that mathematical economics research in our nation has correctly been judged as a natural stage in the development of Soviet science. The idea of the possibility of converting a socialist economy to the conditions of optimum functioning and the constructing of the corresponding system of levers and methods of planning and management for this are the result of the extended development of our economic science and economic practices. It is no accident that beginning with the 1960's, when our nation entered the period of developed socialism, there was increased activity by Soviet economic science, a greater scale and higher quality of its involvement in the elaboration of the major economic planning and economic management measures to improve management, planning and economic incentives in 1965 and 1979, in working out the Comprehensive Program for Scientific-Technical Progress and the interdisciplinary specific programs, the establishing of TPK [Territorial-Production Complexes] and so forth. Precisely in the course of this work, the idea arose of the SOFE [system of optimum economic functioning] which derives from the recognition of the fundamental need for an effective systems approach to the functioning of a socialist economy and its integrated improving.

At present, it can be asserted that a system of economic views has been worked out indicating in which directions the economic mechanism of the nation must be

developed and improved in order to realize the most effective variation of its functioning.

In establishing those methods of economic management and policy which would best ensure the achieving of the strategic socioeconomic goals of a developed socialist society, the SOFE proceeds from the fundamental concepts of socialist political economy, in concretizing them and in formulating the optimality criteria for a socialist economy the methods of extending it into a system of national economic and local criteria and the principles for the effective use of society's production capabilities and for determining the optimum proportions and development rates of the national economy. The research in this area is aimed at elaborating a system of organically interrelated mechanisms and methods of rational management. Within SOFE the efforts should be focused on the general problems of economic optimization, including the effective organization of a hierarchy of relationships between the national economic, sectorial, regional and local management levels.

The speaker emphasized that an understanding of the limited nature and at the same time the variation of resource utilization determines the possible choice of their composition and methods of application. The correlating of a range of criteria for evaluating the production results, in turn, makes it possible to select the most effective variations of national economic development. The converting of the socialist economy into a unified complex provides grounds for realizing an actual choice. The carrying out of these possibilities into reality will mean the optimum functioning of the socialist economy.

N. P. Fedorenko pointed out that the establishing of the SOFE is impossible without thorough research of such problems as public ownership, the separating of the rights and responsibility for controlling it, the principles of cost accounting and no-loss operation, and the measure of independence and responsibility of the economic units. The speaker paid particular attention to the comprehensiveness of socioeconomic development, to the specific orientation, to the transition from working out individual models to constructing systems of them and so forth. He pointed out that the following are essential: to more fully consider in the mathematical economics models the particular features of the reproduction process inherent to its intensive type; to eliminate the existing unevenness in the "developedness" of the various economic spheres using mathematical economics modeling; to strengthen the elaboration of the methods of comparing and correlating social demands, interests and values (in particular, to complete work on a comprehensive method for assessing the effectiveness of economic measures).

V. A. Medvedev (the OAN [Social Sciences Academy] under the CPSU Central Committee) took up the political and economic aspects of the present-day planning and management problems. The increased interest in these was clearly apparent during the anniversary of K. Marx celebrated in 1983 with the tone of the celebration being set by the article of Comrade Yu. V. Andropov "The Teachings of Karl Marx and Certain Questions of Socialist Construction in the USSR" [KOMMUNIST, No 3, 1983] which was widely discussed in the nation and abroad. The necessity of the further development and qualitative improvement of political economy has been brought about by the need for an adequate theoretical reflection of the conditions and needs of developed socialism, and the intensive

type of reproduction aimed at increasing the prosperity of the people and resting on the achievements of the scientific and technical revolution.

The speaker pointed out that the concept of developed socialism elaborated in the party documents provides fundamental concepts and conclusions concerning its economic system. Many of these have been applied in practical measures of improving the economic mechanism. Much has been done to work out the various problems in the special literature. However, the turning of economic theory toward specific economic problems in developed socialism is still far from complete. Significantly more profound research is needed for the following subjects: the development trends in the productive forces under the conditions of the scientific-technical revolution, the patterns of socialist socialization of production, including the problem of public ownership, but not in the declarative formulations but rather in a specific manifestation as was convincingly and profoundly described in the article by Comrade Yu. V. Andropov; the questions related to the higher goal of socialist production, its effectiveness, the mechanism of the planned regulation of production and the use of commodity-monetary relations; to improving distribution relationships. Political economy should serve as the methodological basis for reshaping the economic mechanism.

Next comes the creation of an extended concept of the economic system of socialism based upon a generalization of international experience and excluding a universalization of the experience of just one country. V. A. Medvedev urged the scientists to be bolder in moving from static, descriptive characteristics of the categories and laws of political economy to a detailed, specific elaboration of the problems of the socialist economic system in its actual functioning and development. In this sense it is essential to utilize all the best that has been acquired by various schools and currents to forsake excessive criticism and to pool efforts for a constructive solution to the problems which to a significant degree determine the success of socialist development and the competition with capitalism.

In taking up the higher goal of socialist production, the speaker emphasized the need to concretize it for the entire spectrum of human needs which can actually be satisfied under the given conditions. Political economy should play an important role in establishing the following: the methods of correlating and weighing the social utility of the goods and labor expenditures necessary for producing them and about which K. Marx and F. Engels at one time wrote; the relationships of the individual and social forms of employing the goods and so forth.

There must be a more specific, instrumental approach also to such an integral economic problem as increasing production efficiency. Here we must not forget the basic question of the relationship of the result of socialist production and the expenditures and this most important relationship must not be interpreted as a technical-economic indicator and put outside political economy. A unified indicator for production efficiency is sometimes denied and this is only to the detriment of economic practice. Also negatively felt is the underestimation of consumer value which is still not overcome in political economy as well as the limited notion of the socially necessary labor expenditures as an eternal, fixed category equally applicable for various historical ages and

social relationships. Under socialist conditions there must be a new interpretation of the socially necessary expenditures capable of serving as the grounds for a system of planning norms aimed at continuous advancement and at assimilating the achievements of scientific and technical progress.

Academician L. V. Kantorovich (VNIISI [All-Union Scientific Research Institute for Systems Research]) gave a review devoted to research on optimization problems in automated control systems [ASU]. He emphasized that at present significant advances have been made in working out mathematical economics optimization models employed in analysis, planning and management on various levels of the national economic hierarchy. Linear optimization methods are developing intensely and these are an effective universal means of economic modeling widely employed as the basic apparatus of optimum planning. In parallel with this more precise optimization methods have been developed including: non-linear, dynamic, discrete or partially discrete, involving the ideas and apparatus of game theory, probability theory, mathematical statistics and so forth. The specific programs can also be viewed as a means of optimizing planning decisions. Definite advances have also been made in studying the questions of coordinating and constructing systems of models for large-scale management objects. Certain schemes of planning calculations have been worked out and in a number of instances provided with algorithms employing modular programming and iterative aggregating. These provide the necessary coordinating of the local plans within the multisector complexes. Attention has also been given to the sectorial production development and placement models. These have been employed at various times in solving planning problems in more than 100 production sectors and subsectors. The estimated savings achieved by employing the individual models was hundreds of millions of rubles. The experience acquired here has been generalized in the instructional materials.

Having analyzed the basic stages in the elaboration and realization of the optimization problems, L. V. Kantorovich concluded that their introduction is one of the important sources for the effectiveness of the ASU. However, practice has shown that organizing the work of the ASU and employing optimization problems in them involves significant difficulties: 1) The equipping of the enterprises and sectors with computers has been uneven and often incomplete; 2) the staffing of the ASU for the sectors and computer centers leaves much to be desired; 3) the difficulty of carrying out optimization studies in the ASU and their introduction has been underestimated; 4) the leadership of a number of enterprises did not want to disclose its reserves and resources in order to make taut plans; 5) the implementing of optimization problems often ran counter to the current economic indicators; 6) the interdepartmental problems were not effectively solved due to the uneven preparedness and interest of the departments; 7) the attempts to rely completely on standard problems were unfeasible; 8) not enough work was done on elaborating the process of realizing the optimization problems in the ASU system; 9) there was little control over assessing the effectiveness and encouraging the establishing and introduction of the ASU. On the one hand, these difficulties were underestimated and, on the other, the possibilities of the ASU were overestimated as their potential advantages could not be realized either always or automatically. A well conceived system of measures is required for this.

Academician A. G. Aganbegyan (IE OPP [Institute for the Economics and Organization of Industrial Production]) took up the problems of optimizing regional systems. Common to all the sectors and installations located on a given territory are a range of natural conditions, a unity of the production structure and construction facilities, labor resources, infrastructure and other objective regional reproduction conditions. The sectorial approach cannot consider all of this. In the course of optimizing the regional systems, an additional agglomeration effect appears. The difficulty of optimization is explained primarily by the fact that a regional system which in its nature is multisectorial and the sectors cooperate not only within it but also outside. In addition it is also essential to consider the social and nature-conservation factors. For this reason in studying, seemingly, an independent system, it is essential to consider the entire national economy in optimizing it. For 15 years, the IE OPP has been developing an approach based upon the use of an optimization intersectorial and interregional model. At present, a two-tiered rather flexible system of interrelated models called SIRENA (synthesis, region and national economy) has been worked out. The corresponding program has been prepared. The system has already begun to be used by various regions and republics.

A. G. Aganbegyan gave particular attention to the regional programs such as the formation of the Western Siberian Oil and Gas Complex, the Angara-Yenisey Complex and the economic development of the BAM [Baykal-Amur Mainline] zone. The use of the specific program method in forecasting has been exceptionally productive and provides an opportunity to ensure the interaction of a most powerful scientific tool, optimization modeling, with systems analysis making it possible to think through and establish various scenarios, conduct situation analysis for various criteria and so forth.

The report also dealt with the work of the IE OPP in modeling the activities of the TPK (Sayan, Southern Yakut, Angara) and industrial centers.

V. V. Kossov (GVTs [Main Computer Center] of the USSR Gosplan) described the development of the ASPR [automated system of planning calculations] and the use of mathematical economics methods in national economic planning during the 11th Five-Year Plan. As the preliminary ASPR project approved by the USSR Gosplan in 1977 was carried out, the mathematical economics models proposed by various institutes and the calculations procedures based on them for various sections of the current and long-range plans have been embodied in computer-implemented economic planning problems. More than 3,300 such problems were solved in the first stage of the ASPR put into operation in 1977 in the USSR Gosplan and the Union republic gosplans. At present, their number has surpassed 11,000. In particular, the USSR Gosplan has carried out around 4,500 problems which are designed to provide the calculations for a majority of the sections in the current plans as well as for the most important sections of the long-range ones.

Among these tasks an important place is held by those which ensure the processing of the enormous amounts of information coming into the gosplan from the ministries and departments in the course of forming the national economic plan. Automating the processes of collecting, sorting, aggregating and grouping the data substantially broadens the range and increases the accuracy and up-to-dateness of preparing the information on the basis of which the major planning decisions are taken. At the same time, due to these problems, an information

base is created for calculations using different mathematical economics methods. Among them the most widespread are various types of matrix models which provide for the elaboration of particular and aggregate material balances and allocation plans, balances for labor and financial resources, as well as intersectorial balances for product output and distribution. During the current five-year plan, in further developing the normative base and the balance calculations, chief attention is to be given to bringing them together into large complexes of interrelated problems.

The speaker described in detail the following: the central complex of problems (TsKZ) for the ASPR of the USSR Gosplan; the range of balance indicators for the development of material production employing a progressive normative base; a unified system for capital construction planning. The main particular feature in the development of the ASPR during the current five-year plan will be to move from automating the local problems oriented at the inferior and middle level of specialists at the USSR Gosplan and the Union republic gosplans to employing modern data processing methods and equipment in studying and taking planning decisions on the most important and fundamental planning problems in the upper leadership level. The process of equipping the planning bodies with minicomputers which started during the Tenth Five-Year Plan will be developed. V. V. Kossov pointed out that a significant scientific start had been made in the area of working out various systems of models for national economic planning. Some of them have undergone or are undergoing an experimental check at the GVTs of the USSR Gosplan. An emphasis has been put on combining the already introduced and newly posed problems into large complexes. The active involvement of scientists and institutes of the USSR Academy of Sciences in this work will make it possible to successfully solve the very complex procedural and technological problems existing here.

The report of Academician of the Ukrainian Academy of Sciences N. G. Chumachenko (IEP [Scientific Research Institute for Economic Problems in the Comprehensive Development of the National Economy] of the Ukrainian Academy of Sciences) given at the conference by Corresponding Member of the Ukrainian Academy of Sciences N. I. Ivanov examined the questions of using mathematical economics methods in the planning and management of industrial enterprises. It was emphasized that the proposed and realized methodological principles and algorithmic schemes encompass the most rational ways for the mathematical positing and examination of the nature of extremal solutions in the optimization problems. Sections of mathematical optimization theory have been worked out for various methods of representing elements and sets of possible solutions, classes of function criteria and the techniques for preparing, evaluating and taking decisions in the specific systems and situations. These results are employed in setting up ASU at enterprises and associations. In particular, the method of sequential analysis of variations has produced an economic effect of around 30 million rubles from the automated designing and management systems.

The ASU-Donetsk [Donetsk Automated Control System] has been put into operation and this can solve more than 140 economic problems, including for optimizing production plans. Subsequently this experience has been employed at a number of large enterprises. In the speaker's opinion, the basic reason for the small proportional amount of optimization problems in the ASUP [enterprise automatic management system] is the inadequacy of the elaborated optimality models and

criteria to the actual controlled processes. Fundamentally new approaches are needed to the computer modeling of management decisions. The essence of one such approach is the following. For describing the process of production management, complex dynamic models are constructed into which are incorporated the nonlinear constraints and functions, the discontinuous and discrete variables. With the help of the corresponding analytical conversions, the nonlinear functions are converted into separables and approximate methods of separable programming are employed for numerical analysis of the models. At present, the results of similar experimental calculations using computers have been published and in comparison with the existing methods the labor intensiveness of making the calculations is reduced by almost 10-fold.

The section Theoretical and Methodological Problems in the Optimum Functioning of the Socialist Economy and the Modeling of the Economic Mechanism discussed 12 basic reports and 36 exhibit reports.

N. Ya. Petrakov (TsEMI) raised the question of the insufficient effectiveness and information value of the existing economic measurements and indicators under the conditions of a material and financial imbalance. In this instance the cost indicators lose the properties of dependable economic indicators and the effectiveness of the economic incentive system is reduced. N. Ya. Petrakov asserted that the strengthening of the physical aspects of planning here does not solve the fundamental management problems primarily because physical indicators do not provide comparability of the different variations of economic decisions in terms of their national economic effectiveness. The speaker formulated a number of recommendations which as a whole come down to elaborating a mechanism for maintaining a material and financial balance in the national economy. Among these a central place is held by the proposals related to realizing an optimization principle for a unity of price and the plan.¹ The way to such unity, in the opinion of N. Ya. Petrakov, lies by gradually bringing closer together prices from a price model for planned expanded reproduction and the prices of marginal effectiveness.

V. D. Belkin (Economics Institute of the USSR Academy of Sciences) studied commodity-monetary balance and the methods of ensuring it, relying on "income--commodity" and equal price models. During the first stage he proposed bringing prices into accord with the existing ratios of solvent demand and supply and, in the second, to bring them closer to the social production outlays (the best expression of which, in the speaker's opinion, is the production price formula).

Corresponding Member of the USSR Academy of Sciences S. S. Shatalin and V. G. Grebennikov (VNIISI) have formulated the basic areas of research on analyzing the ratios of income distribution for the members of a socialist society within the framework of SOFE theory, having paid particular attention to the links and differences in the social and economic aspects of this problem. In particular, it is essential, in the opinion of the speakers, to have a thorough analysis of the "reverse" influence of the improvement in distribution relations on the optimality of production resource utilization.

¹ See his article in our journal, No 2 for 1983.

N. M. Rimashevskaya (TsEMI) devoted her paper to the methodological aspects of forecasting the prosperity of the public. She pointed to three variations of forecasts deriving from production, consumption and distribution approaches and described a system of models worked out for forecasting the prosperity of the people.

Ye. Z. Mayminas (TsEMI) examined certain general questions in the methodology of economic cybernetics as a science dealing with the functioning and development of the economy as a controlled system and primarily the mechanisms of controlling it which in their content are informational ones. He particularly emphasized the need to broaden and improve the training of skilled specialists on the faculties and divisions of economic cybernetics at the nation's VUZes, for the need for such specialists is very great.

The report of V. I. Danilov-Danil'yan and A. A. Rybkin (ANKh [Academy of the USSR National Economy], VNIISI) discussed methodological questions of employing optimization modeling in the economy. The elaboration of SOFE has aggravated and concretized the posing of major methodological problems of economic science. In the opinion of the authors, the most crucial difficulties arise with direct optimization of the national economic plan on the basis of the presently existing formal apparatus as well as in attempting to convert the economy to an optimum functioning mode by imparting the corresponding properties to its parameters and relationships without optimizing the plan as a whole. However, such difficulties do not occur in employing optimization models as a means of formulating and analyzing planning and management decisions, particularly in regularly repeating local situations.

K. A. Bagrinovskiy (TsEMI) devoted his paper to the questions of employing simulation modeling in the economy. This area of research has recently undergone great development both in our nation and abroad. Simulation experiments using models of real systems have become a recognized method for studying economic processes. Great attention is being given to a sound analysis of calculation results and to examining the relative role of factors influencing the course of the simulated process. A man-machine dialogue is being employed evermore widely and this has led to the elaboration of special man-machine simulation systems. On the basis of the existing experience, the author formulated the most important demands on the dialogue systems and on their use.

Various aspects of improving economic management were taken up in the following reports: by V. A. Volkonskiy (TsEMI) on the ways for increasing responsibility and incentive in an economic management system; Yu. V. Ovsiyenko (TsEMI) on working out a system of planning economic norms; D. S. L'vov (TsEMI) on a system of economic measurements and its role in the development of methods for evaluating the effectiveness of taking economic decisions. K. K. Val'tukh (IE OPP) gave the results of mathematical economics research on the properties of the law of value and their manifestation in the price formation system.

The section on "The Methodology of Integrated National Economic Planning" (7 basic reports and 35 exhibits) discussed the questions of improving long-range socioeconomic planning, the elaboration and use of comprehensive national economic programs, as well as modeling and automating the processes of elaborating and implementing the plans.

O. M. Yun' (USSR Gosplan) as well as Ye. Z. Mayminas (TsEMI), V. L. Tambovtsev (MGU [Moscow State University]) and A. G. Fonotov (TsEMI)² studied the problems of elaborating a concept for the economic and social development of the USSR over the long run, a methodology for socioeconomic planning, an analysis of goals and their concretization in a system of specific indicators and norms. The reports proposed methods for coordinating goals and resources making it possible to analyze the structure and dynamics of the national economy as well as consider factors of ambiguity and inertia.

The section examined methodological and procedural questions for working out ASTR and the experience acquired in this area. Thus, B. A. Rayzberg and G. I. Kuranov (NIEI [Scientific Research Economics Institute] of the USSR Gosplan) pointed out that the constructing of the ASPR not only took into account planning experience but also initiated new effective ways and areas for improving planning activities. In particular, the prerequisites were established for deepening the variant approach, for increasing the number of cycles in the iterative coordinating of plan decisions and calculations and for broadening the range of problems solved. At the same time, with the elaboration of the ASPR planning activities have come to include formalized concepts of the economic planning problem, planning techniques and other means for describing the planning processes. This has made it possible to design them effectively and in a logically clear manner. B. A. Rayzberg and G. I. Kuranov also took up questions related to the second stage of the ASPR.

In the section's work great attention was paid to the problems of working out and realizing comprehensive national economic programs. In particular, M. L. Raman (Latvian Gosplan) shared the experience of specific program planning and the realizing of specific comprehensive programs as acquired in this republic. Here they have provided an original and effective solution for a number of problems related to the formulating of the specific programs, to organizing the control of their realization and the organic incorporation of them into the national economic planning system. However, the setting up of special "staff" groups for control and coordination has not been "legitimized" (the republic has experience in establishing such bodies) and the encouraging of the program measures has not been worked out.

The reports noted definite advances in the given area. The USSR Gosplan has established and approved procedural provisions for working out the national economic programs and there is serious methodological work on certain related problems. At the same time many of the questions involved in controlling the implementation of the programs and their coordination with the nation's economic and social development plans are still waiting for their solution. Thus, M. K. Klimov (USSR Gosplan), Ye. D. Novikov and Yu. M. Samokhin (TsEMI), having analyzed the actual employment of the comprehensive programs, pointed out that for now the specific program methods have still not fully disclosed their capabilities. In particular, there is an alarming abundance of programs being worked out and carried out simultaneously as well as a lack of clarity and different demands for them.

² See their article in our journal, No 4, 1983.

Ye. G. Yasin (TsEMI) took up the relationship of planning and the economic mechanism for realizing the plans, having emphasized that the existing detailed recommendations are, unfortunately, being introduced slowly and half-heartedly. For example, even where the norms for the payment for productive resources are employed, this is not being done comprehensively, there is not enough flexibility and most importantly there is no coordination with the plan. For overcoming the designated shortcomings it is essential to have a unity of the plan and economic norms and primarily prices. The speaker made a proposal for a procedure to work out the norms and introduce them in practice. This will create the prerequisites for strengthening cost accounting and broadening enterprise independence.

V. A. Zhitkov and K. V. Kim (TsEMI) analyzed certain opportunities of simulation modeling for selecting and assessing recommendations to improve the economic mechanism for managing and coordinating the decisions being made.

In the section on "Methods and Models of National Economic and Regional Planning and Forecasting" (11 basic papers and 52 exhibits), basic attention was focused on the problems of introducing models for a central complex of ASPR problems relating to the second stage of this system. At present, we can already speak about the direct use of intersectorial models in preparing the draft plans, however still to be solved are the questions related to the organizing of the data flows for filling out the models, to the transition to planning from needs and so forth. The need was pointed out of paying more attention to acquiring and generalizing experience in constructing the models and more widely utilizing the ones which have been worked out and which have undergone experimental and practical testing. This was described in detail by Ya. M. Urinson (GVTs of the USSR Gosplan).

Another group of problems was devoted to improving the mathematical economics models themselves and to bringing them closer to the actual problems which arise in the process of converting the economy to predominantly intensive development. Among these are: introducing the achievements of scientific and technical progress, resource interchangeability, mechanization and automation of labor processes and so forth.

A significant portion of the reports, basically prepared by representatives from the Union republics, was devoted to developing methods of regional modeling, primarily of the macro- (a system of models, intersectorial and econometric models) and micro-regional levels (modeling the TPK) and environmental conservation measures. In the research more and more attention is being given to describing social processes and, in particular, to modeling the processes of the movement of labor resources and the population, the reproduction of labor resources and so forth.

F. N. Klotsvog (NIEI of the USSR Gosplan) described a system of six intersectorial models which have been worked out now at the institute: consolidated balance and optimization dynamic ones; static as well as semidynamic and dynamic optimization models for a physical-cost intersectorial balance; a model for planning financial proportions. Having analyzed the functions performed by the intersectorial models, the speaker pointed out that the elaborated system cannot be considered complete as it reflects only the stage reached in the development of intersectorial research and will be enriched.

E. F. Baranov (TsEMI) set out the tasks involved in improving the methods of modeling the regional economy, A. G. Granberg (IE OPP) examined the questions of synthesizing regional and national economic models, E. Turkebayev, S. Bayzakov, Zh. Yertlesova and Ye. Utembayev (NIEIPiN [?Scientific Research and Experimental Institute for Planning and Norms] under the Kazakh Gosplan) formulated certain common-system demands on optimizing the regional economy, M. M. Albegov and A. V. Kil'tsov (TsEMI) characterized the range of models being worked out for the regional level and designed for subsequent incorporation in the system of the national economic planning models and R. L. Rayatskas (Vilnius State University) proposed principles for the fullest consideration of ecological problems in modeling socioeconomic development.

At the section on "Methods and Models for Optimum Planning and Forecasting in Sectors" (11 basic papers and 49 exhibits), it was pointed out that the sector is a sphere of intense scientific research and applied developments in the area of optimizing economic decisions and that here the question of creating and employing mathematical economics models and methods is in full swing. Correspondingly, rich experience has been gained and this was reflected in the reports. A number of them was devoted to investigating the theoretical and methodological problems of improving the principles and methods of sectorial planning on the basis of employing mathematical economics methods with the isolating of the range of questions related to forecasting, long-range, medium-term and current planning. Thus, O. V. Golovanov and S. A. Yemel'yanov (VNIPI OASU [All-Union Scientific Research and Design Institute for Sectorial Automated Management Systems]) generalized and analyzed the experience of optimum planning in the instrument building sector and provided an unique inventorying of the urgent problems involved in working out model, program, procedural and other types of support for optimization calculations in the OASU. Among the reports in this group we must also mention those where chief attention was given to analyzing the interaction of the methodology of optimum sectorial planning with the existing economic mechanism and to working out the structure and principles for the functioning of a system of mathematical economics models. V. V. Kuleshov, V. V. Radchenko and N. V. Chernaya (IE OPP), I. V. Nit (MGU) and others took up these questions. One must note the clearly increased desire of the researchers in the model constructs to more fully consider the real conditions of the functioning of the sectorial production and organizational structures (in particular, such features as the ambiguity of the initial information, the substantial "horizontal," often informal ties with other sectors and branches of the national economy, the presence of unformalized stages in planning techniques).

Having emphasized that the successes in the positing and solving of "ideal" problems in optimum planning have made it possible to move on to the constructing of complexes of planning models, K. A. Antanavichyus (Vilnius Construction Engineering Institute) proposed constructing a system of models for the functioning of the corresponding economic projects. These systems would consist of heterogeneous mathematical economics models and calculation algorithms and would also encompass the comprehensive normative reference base, the processes for preparing the initial data and generating numerous possible production and technological situations and their probability estimates, including subjective ones.

The designated trend in the development of the methodology of sectorial optimization research has been apparent in the fact that a significant group of works was represented which set out the specific experience and results of modeling the schemes for taking planning decisions with the incorporation of optimization models and methods in them as well as the elaborating of the corresponding means of support and realizing the schemes under the conditions of long-range and current planning of the individual sectors and intersectorial complexes. Among these were the papers of V. D. Marshak (IM [Mathematics Institute] of the Siberian Division of the USSR Academy of Sciences), B. P. Suvorov (TsEMI), Yu. Ye. Kushnir, A. S. Nekrasov and T. M. Polyanskaya (ENII [Power Institute] imeni G. M. Krzhizhanovskiy), V. G. Martynov (TsEMI), O. B. Braginskiy (TsEMI) and others. The principles formulated in these papers for the individual sectors for the modeling and functioning of the model schemes are of an importance going beyond the limits of the designated sectors.

The section also took up the scientific results obtained in almost 40 sectors and subsectors of the national economy and this in and of itself bespeaks the scale of the work being done.

The basic questions examined in the section on "Methods and Models of Optimum Planning for Associations and Enterprises" (9 basic papers and 37 exhibits) were the systems optimization of production management and the development of various types of ASUP.

V. V. Shkurba (Cybernetics Institute of the Ukrainian Academy of Sciences) pointed to the necessity of integrating the employed models (as modules) into an integrated modeling function and which requires a developed multilevel system of interrelated information and algorithmic means. In particular, he recommended using so-called modifying modeling.

The other papers analyzed the new possibilities of developing management systems for enterprises (V. N. Andreyev from the Leningrad Financial-Economics Institute) and associations (V. I. Danilin, N. V. Makhrov and A. A. Modin of the TsEMI), with the optimizing of the management of these units being viewed as an inseparable part of optimizing the economic mechanism as a whole. In particular, V. N. Andreyev proposed establishing enterprises with a special collective-use status and these would produce types of products the demand for which is hard to forecast. Certain principles in constructing the multilevel production management systems were described by T. P. Podchasova (Cybernetics Institute of the Ukrainian Academy of Sciences). Among these the central place was held by the principles of systems optimization as formulated by Academician V. M. Glushkov.

A number of speakers investigated particular questions in the forming of ASUP at enterprises in different sectors and particularly the experience gained in this area. Thus, N. O. Vil'chevskiy and A. A. Pervozvanskiy (Leningrad Polytechnical Institute) told about the management of production stocks, M. V. Portugal and V. K. Kublikov (Odessa Polytechnical Institute) described the organizational structure of operational management.

In the discussion greater interest was apparent in working out models which would reflect the real conditions for the functioning of the modeled systems

more completely than did classic ones. In particular, it was a question of planning and management models for conditions of incomplete information, of considering random factors as well as social and psychological aspects in them. The results were given of machine experiments for analyzing the effectiveness of different variations of the economic mechanism for enterprises.

I. M. Bobko (VTs [Computer Center] of the USSR Academy of Sciences) studied the particular features of the methods of utilizing optimization methods in the ASU and L. Sh. Gaft (IEP of the Ukrainian Academy of Sciences) took up the organizational questions of introducing optimization problems at the industrial enterprises. N. B. Mironosetskiy (IE OPP) pointed out that the basis for the extensive introduction of optimization models is their employment in an interactive mode with a developed dialogue support and the organizing of business games on this basis. Experience in this area can be found at the Siberian Division of the USSR Academy of Sciences (the Sigma Management System).

The section on "Mathematical Support for the Tasks of National Economic Planning and Management" (7 basic papers and 31 exhibits) pointed out that the mathematical support [software] for mathematical economics modeling is being worked out within the research on the most different subjects (economics, computer mathematics and programming). Basically, three aspects of this range of questions were examined: in the first place, the problems of developing a system of notions and modeling the relationships of economic agents in complex economic systems; secondly, mathematical programming (linear, nonlinear, convex and discrete); thirdly, the state and prospects for the development of applied statistics.

In the first of the designated areas, a paper was given by the Corresponding Member of the USSR Academy of Sciences V. L. Makarov (Mathematics Institute of the Siberian Division of the USSR Academy of Sciences) who analyzed the connection and relationship of the concepts of desirable economic states which are based both on the postulate of individual rational conduct and collective rational behavior (Pareto-optimum states, the economic core and economic equilibrium); a vast class of trajectories (and the mechanisms giving rise to them) capable of converging on the desired economic states was also examined. V. M. Polterovich (TsEMI) pointed out certain fundamental problems arising within the new economics mathematical apparatus which in recent years has been developed both in our nation and abroad; an apparatus related to investigating the functioning of economic systems with "non-ideal" (for example, unequal) prices.

L. G. Babat, S. G. Vleduts, Ye. V. Levner, A. A. Fridman, M. A. Frumkin and Yu. I. Khmelevskiy (TsEMI) investigated the problem of the complexity of discrete optimization problems and the approximate methods of solving them and they gave a review of the methods and achievements in the area of constructing the corresponding algorithms. A. S. Nemirovskiy (MGU) and Yu. Ye. Nesterov (TsEMI) reported on the complexity of optimum algorithms in another area of programming, in convex programming. E. P. Borisova, Ye. G. Gol'shteyn, K. V. Kim, U. Kh. Malkov (TsEMI) and A. I. Stanevichyus (VTs [Computer Center] of the USSR Academy of Sciences) gave a review on the basic areas where in recent years the elaboration of linear programming (LP) methods has been concentrated. From the theoretical results in LP in the report, the following should be particularly mentioned: the establishing of the polynomial complexity of LP

problems, estimates for the average number of iterations in the simplex method and new methods of eliminating recycling. Also described were the state of the program support for LP, the trends of its development and the methods of ascertaining the best program means.

S. A. Ayvazyan and N. G. Zagoruyko (TsEMI) devoted their paper to the attempt to employ and the prospects of developing applied statistics in solving various socioeconomic problems. B. G. Mirkin (TsEMI), V. T. Perekrest (ISEP [?Institute for Socioeconomic Planning]) and Yu. N. Tyurin (MGU) described the basic results and problems in the area of constructing the mathematical, methodological and program support for processing nonquantitative-type data arising in socioeconomic research. In particular, they examined models designed to analyze rankings, groupings, for describing features and investigating relationships (including multidimensional scaling).

At a session of the section it was pointed out that there must be a further improvement in the system of mathematical economics concepts as this should serve as the basis for modeling economic systems. Many concepts employed by economists require the constructing of the corresponding mathematical structures. Optimization methods are a rather mature system both in applied and theoretical terms. There must be a comparative analysis of their program support employed in various organizations. The section gave a number of examples of the elaboration of not individual programs but rather program complexes for various problems of mathematical economics modeling; however, much remains to be done in this area.

The conference recommendations emphasized that the decisions of the 26th CPSU Congress and the November (1982) Plenum of the CPSU Central Committee demand that economists raise to a new level the research related to developing the theory and methodology of planning and management for a socialist economy. The task is, in ensuring the development of fundamental research, to increase the effectiveness of the applied studies aimed at improving planning and management of the national economy as a single complex.

Having noted the successes and shortcomings in the area of working out mathematical economics methods and models designed to improve management and planning, the conference recommended, in particular:

1. In the area of the economic theory of developed socialism to focus efforts on the pertinent questions of the optimum functioning of the socialist economy and improving the economic mechanism, including:

- a) Creating an integrated concept of optimum planning and functioning of the socialist economy; considering social factors and their organic combining and interaction in the economic research; research on theoretical questions of linking the plans into a single system, increasing the level of coordination in the sectorial, territorial and program aspects of the plan; the theoretical basing of practical proposals for a rational combining of centralized planning with the development of the economic independence of enterprises and associations and further developing the creative activities of the labor collective;

b) Working out methods for ensuring the balancing of the physical-material and value aspects as an essential condition for optimizing the functioning of the economy; principles for constructing a system of optimum resource estimates and the problems of their employment in the process of improving the planned price system and economic norms; problems of forming and utilizing reserves and the management of production inventories in the single national economic complex;

c) Improving distribution relationships in the system of the optimum functioning of the national economy and in the problems of the prosperity of the people.

2. In the area of the methodology, theory and practice of integrated socioeconomic planning, research should be developed in the following areas: the methods of studying the goals of the economic and social development of the nation and their concretization in specific indicators and norms of the long-range plan; methods of coordinating the goals and resources in socioeconomic planning and assuming an analysis of the structure and dynamics, an assessment of the flexibility of the resource potential and consideration of the factors of ambiguity and inertia in its development; the methods of forming the concept of national economic and social development for the long run; the methodology of establishing specific programs, their correlating with the economic and social development plans, the methods of constructing and implementing the programs to solve socioeconomic and scientific-technical problems; approaches to elaborating and coordinating the systems of indicators for the long-range, medium-range and short-range plans.

3. In the area of constructing sets of models for long-range and current planning of economic development for the nation and the regions, in the aim of elaborating recommendations for incorporating these in the ASPR, primary attention should be given to the following:

a) To the development goals of the socialist economy and their adequate reflection in the system of optimality criteria of different levels as well as to the principles for coordinating the models reflecting various aspects in the functioning of the socialist economy; to improving the existing means of modeling economic processes and to developing new ones; to developing systems of national economic planning models which provide for the simultaneous determining of the planning proportions and the parameters of the economic mechanism; to reflecting the impact of socioeconomic factors on planning decisions in the systems of models; to determining the most effective areas of regional development considering scientific and technical progress and its socioeconomic consequences; to reflecting, in particular, the agglomeration effect of production concentration in the models;

b) To strengthening the coordinating of research in the area of systems economic modeling on the national economic and regional levels; to preparations for the regular (once every 5 years) carrying out of combined calculations by the central and regional economic institutes in the aim of establishing the quantitative indicators in the comprehensive program for scientific and technical progress, the overall concepts and draft of the basic directions of economic and social development for the period of the long-range plan, as well as schemes for the development and placement of production using mathematical economics models and their systems.

4. In the area of sectorial optimization, in considering the existing procedural and organizational difficulties in carrying out the work and, in particular, in the stage of introducing the results of the optimization calculations, the following is essential: to better consider the specific features of the sectors, the conditions of the current economic mechanism and the trends in its improvement, having paid particular attention to establishing and introducing current planning systems for the production and distribution of the products; to strengthen attention to the procedural and organizational-legal support for the conditions of employing mathematical economics methods and computers in planning practices as well as to the constructing and introducing of economic organizational schemes for taking planning decisions based on optimization calculations; to broaden research on the questions of constructing a system of optimum planning models for the nation's agroindustrial complex considering the particular features of the regions and the ties of the agroindustrial complex with the other national economic complexes.

5. In the area of the methods and models for the optimum planning of operations by the associations and enterprises, the efforts of specialists must be concentrated on the following: working out the questions of modeling and assessing the effectiveness of the economic mechanism in improving intereconomic ties; developing the methodology of systems optimization (considering the interaction of the enterprise with the management bodies and the supply and consumer organizations) which would ensure the effective adjustment of production to the end national economic results; modeling plans as multilevel hierarchical structures and creating sets of models for decision taking to be utilized by various elements in production management; modeling the development of the production associations; constructing a set of models for calculating the draft five-year plans and investigating variations in the long-range development of the production associations.

6. In the area of working out the mathematical apparatus for mathematical economics modeling, it is essential: a) to develop a system of mathematical economics concepts and corresponding mathematical constructs as well as new ideas and methods for analyzing the mathematical economics models considering the factor of multiple criteria, incompatibility as well as stochastic and accuracy factors; to continue research aimed at developing the concept of complexity and assessing the complexity of various classes of optimization problems and increasing the effectiveness of the algorithms in mathematical programming;

b) To strengthen research on establishing a unified methodology to construct statistical solving rules as well as permanent statistical data and methods for processing different types of data;

c) To improve the program support for the problems of optimization and applied statistics in the aim of establishing program-oriented files, libraries and modules of programs designed for use on various levels of economic modeling, planning and management.

The recommendations also emphasized the importance of the following: research in the area of a scientific systemization of the optimization models and objects of management and the creation on this basis of a catalog of optimization problems for their practical employment in plans and in introducing the ASUP; the

construction of simulation models for improving the methods of working out and implementing the plans as well as for research and a comparative evaluation of different variations of planning and economic incentive schemes; studying the questions of forming the information and technical base for the management of the unified national economic complex. Particular attention was paid to the necessity of improving the training of mathematician-economists and their employment in the national economy.

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PLANNING AND PLAN IMPLEMENTATION

ELEVENTH FIVE-YEAR PLAN REACHES DECISIVE STAGE

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[Editorial: "An Important Stage in the 11th Five-Year Plan"]

[Text] The 1984 State Plan for the Economic and Social Development of the USSR as approved basically by the December (1984) Plenum of the CPSU Central Committee and adopted by the Ninth Session of the USSR Supreme Soviet, Tenth Sitting, is the next important stage in carrying out the quotas of the 11th Five-Year Plan.

The speech at the plenum by the General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, Yu. V. Andropov, contains a profound analysis of the 1984 plan which conforms to the political and economic strategy of the party as elaborated at the 26th CPSU Congress, the November (1982) and June (1983) Central Committee plenums. This important political document sets out the proposals and conclusions on the key economic tasks at the present stage and poses cardinal problems for further national economic growth and consistently improving the economy of a developed socialist society.

In 1983, the crucial year of the five-year plan, in comparison with the first 2 years of the five-year plan, higher rates were achieved for economic development and the growth of the people's prosperity, as well as absolute increases for a number of the general economic indicators. Conditions were created for fulfilling and overfulfilling the plan in terms of the volume and rate of industrial production. The plan quotas were fulfilled for the effectiveness indicators and primarily for the growth of labor productivity.

The volume of agricultural product, according to the preliminary data, increased by 4.6 billion rubles and the purchases of livestock, poultry, milk and eggs increased.

In 1983, 3,700 types of new machinery, equipment, instruments and materials were put into production, a number of efficient production processes were introduced and the use of industrial robots was expanded.

Using the state capital investments, the completion of fixed capital increased by more than 4 percent in comparison with 1982.

The program has been successfully carried out of further increasing the prosperity of the people. Average monthly wages of employees rose by 2.4 percent. Wages for kolkhoz members increased basically due to carrying out economic incentive measures envisaged in the decisions of the May (1982) Plenum of the CPSU Central Committee.

In 1983, housing construction, public education and public health were further developed.

As was pointed out in the speech of Comrade Yu. V. Andropov at the December (1983) Plenum of the CPSU Central Committee, the state plan should be a law in the economic life of all the economic sectors and for thousands of enterprises, associations and organizations.

The 1984 plan quotas will be carried out under the conditions of an increased scale of industrial and agricultural production, the broadening of the nation's production apparatus on a higher qualitative basis and increased skills of the workers, white collar personnel, engineers and technicians. Production automation is to be carried out and there will be the broadest employment of computers and robots and the introduction of flexible production methods making it possible to quickly and efficiently adjust production to the manufacturing of new products.

For such production, even now we must have more and more specialists capable of responding quickly to the constantly updated and more complex technical and production tasks and skillfully carry them out.

In today's situation, greater importance is being assumed by the concentration of material and financial resources on the most important, nearly completed projects and focusing attention on carrying out the tasks of the technical re-equipping and reconstruction of operating enterprises.

The plan for the last year of the 11th Five-Year Plan will contain an extensive program for the development and modernization of the national economic sectors, for strengthening their material and technical base, for increasing the technical level of production and the quality of the produced product, for improving the national economic infrastructure and further raising the standard of living of the people.

The national income used for consumption and accumulation will rise in 1984 by 3.1 percent in comparison with 1983; the industrial product by 3.8 percent, including 3.7 percent for the "A" group and 4.0 percent for the "B" group. The volume of gross agricultural product will increase by 6.4 percent; retail commodity turnover by 5.4 percent and the real per capita income by 3.5 percent. Here in national income there will be an increased share in the consumption fund both absolutely and proportionately as well as absolute increases in the product volumes of industrial and agricultural production.

The 1984 plan contains specific quotas for further increasing production efficiency. Some 97 percent of the entire increase in national income will come from increased labor productivity; 90 percent for the growth of industrial product; in construction 90 percent of the increase in construction-installation

work will come from this factor; in agriculture and in rail transport, the entire increase, respectively, in the product volumes and traffic will be due to this.

The Soviet people have responded ardently to the appeal contained in the speech of Comrade Yu. V. Andropov at the December (1983) Plenum of the CPSU Central Committee to achieve at a 1-percent above-plan increase in labor productivity and reduce product costs an additional 0.5 percent, viewing this as an additional party quota for the plan.

The 1984 plan quotas to an ever-greater degree are based upon the use of the achievements of scientific and technical progress in the national economy. The decree adopted in 1983 of the CPSU Central Committee and the USSR Council of Ministers "On Measures to Accelerate Scientific and Technical Progress in the National Economy" focuses the scientific and economic bodies on increasing the level and results of scientific research, on actively aiding in the large-scale introduction of scientific achievements into production and on concentrating the scientific potential on carrying out the key tasks which ensure the satisfying of both the current as well as the long-range national economic needs.

The ministries and departments in this regard must be constantly concerned with the questions of the scientific and technical reequipping of production and they must satisfy the demand for high-quality product. Measures must be taken to further strengthen all the units involved in the development and introduction of new equipment, from the training of scientists and specialists, the accelerated construction and technical equipping of prototype and experimental facilities and production to establishing capacity reserves for working out and developing the output of progressive types of equipment and materials. One of the main areas of work in this field, starting in 1984, will be extensive automation of the production processes based on the use of automated machine tools, machines and mechanisms, unified modules of equipment, robot installations and computers.

It has been established that now quotas for technical and scientific development will be included among the most important indicators used to assess the results of the economic activities by the collectives and to sum up the results of the socialist competition.

The 1984 State Plan for the economic and social development of the USSR includes over 1,150 quotas for putting new types of product into production and over 380 quotas for introducing progressive production processes, equipment for the mechanization and automation of production. As a total, considering the plans of the ministries and departments, there are provisions to develop around 3,900 new types of machines, equipment, instruments and materials. At the same time around 2,200 types of obsolete products will be taken out of production in industry and the old-fashioned production processes will be replaced.

The putting of new technical means and progressive production processes into production as well as the planned expansion of the volume of their introduction will help to accelerate scientific-technical progress and to improve the general economic indicators for the development of the national economic sectors.

Much remains to be done for increasing product quality, and as a result of this the proportional amount of superior-quality industrial products will increase in the total volume of product output.

We will continue to carry out the 170 national scientific-technical programs which envisage the further development of scientific research, design development and measures to introduce new equipment and production methods.

In 1984, joint developments on a multilateral basis will be carried out on scientific and technical problems by scientists from the USSR and the CEMA member nations, including the problems contained in the Coordinated Plan for Multilateral Integration Measures of These Nations for 1981-1985 as approved by the 35th CEMA Session.

A characteristic feature of today's stage of economic development is an increased role and responsibility for the planning and economic bodies in the greatest possible improvement in the quality indicators, including the more economic consumption of raw products, materials, fuel and electric power.

The question of observing economy conditions have been constantly at the center of attention for the party and government. However, it must be pointed out that certain ministries and central departments still do not provide a proper level of work in the rational use of raw products and materials and in combating losses, waste and mismanagement. Material resources are allowed to be wasted, the necessary accounting and safekeeping of them are not ensured, losses from bad workmanship are high, and sometimes the plan norms are overstated in comparison with what has actually been achieved. In line with this, the 1984 plan, along with reducing the consumption standards for material resources, has envisaged quotas for reducing the overall consumption of these resources for the specific allocation holders. This obliges the ministries, departments and Union republics, on the basis of the designated quotas, to set differentiated and careful, technically sound quotas for the associations, enterprises, construction projects and organizations in the area of an additional reduction in the consumption of material resources so as to reduce the material intensiveness of social production as a whole.

There are also great reserves in the sphere of employing ferrous metals. Positive experience in this area has been acquired by the workers and specialists of Chelyabinsk Oblast. The oblast's enterprises widely employ low-waste and waste-free production methods and mass certification of the parts and assemblies for material intensiveness; cost accounting, personal and collective thriftiness accounts are being introduced in the production units.

We should also note the experience of Saratov Oblast in the saving of fuel and energy resources and here they have achieved an increase in the production volumes that is twice the amount of the increase in electricity consumption. The measures carried out in the oblast have made it possible during the Tenth Five-Year Plan and over the 2 years of the 11th Five-Year Plan to save a significant amount of electric energy, heat and fuel. The rational consumption of fuel and energy here is directly reflected in the socialist obligations, in the summing up of the competition results as well as in the moral and material incentives.

Each year the mining industry delivers to the national economy more than 15 billion tons of mineral raw materials, including more than 1.5 billion tons of ores. In line with the decline in the metal content in the ores and the increased need of the national economy, the volume of ore mass removed doubles approximately every 10 years.

For ensuring the economic and complete use of the raw materials, a specific comprehensive scientific and technical program "The Development of Equipment and Methods for Mining and Enriching Minerals and Introducing Cyclical and Flow Methods for Strip Mining" has been worked out. It provides the following: the creation of progressive production processes and equipment for mining and processing the ores of ferrous, nonferrous and precious metals, increasing the complete extraction of the useful components and the comprehensive employment of the mineral raw material. Even during the 11th Five-Year Plan, the carrying out of this program will provide a tangible effect to the national economy.

A characteristic feature of the 1984 plan is the more rapid growth of the manufacturing sectors of industry. Thus, with a rise of 3.8 percent for industrial product as a whole, the product of the manufacturing industry will increase by 4.4 percent, including by 5.8 percent for machine building.

The indicators for the development of the agroindustrial complex for 1984 have been worked out in accord with the decisions of the May and November (1982) Plenums of the CPSU Central Committee as well as the quotas of the Food Program. In comparison with 1983, the kolkhozes and sovkhozes will receive increased deliveries of agricultural equipment, mineral fertilizers and plant protection chemicals.

Of great importance for the further development of agricultural production is the recently adopted decision of the Politburo of the CPSU Central Committee on working out a long-range program for land reclamation in the aim of creating a guaranteed food supply and increasing the well being of the Soviet people.

At present, the improved lands produce all the cotton and rice, two-thirds of the total amount of vegetables, around one-half of the fruits and grapes and one-quarter of the amount of succulent and coarse feed. However, for the consistent and successful implementation of the Food Program, it is essential to raise reclamation to a qualitatively new level and more fully utilize its capabilities for increasing the production of agricultural products and raising the stability of farming.

The experience acquired in this area and the presence of a network of water management organizations which possess solid production facilities and stable collectives of land reclamation specialists have made it possible to carry out difficult and large-scale tasks in the development of this sector on the basis of a comprehensive long-range program. In working it out, prime attention will be given to implementing measures which ensure the obtaining of a high return from the irrigated and drained lands on the basis of improving their condition, better operating the water management systems, widely introducing efficient irrigation methods and a rational planting structure, carrying out conservation projects and redistributing the water resources in the interests of the national economy.

All types of transport will undergo further development on the basis of improving the organization and increasing the efficiency of their operations, in particular, by eliminating stoppages and empty runs of the means of transport. The freight turnover of all types of transport will increase by 3.1 percent, including by 1.8 percent for rail transport. This will basically meet the needs of the national economy for shipments.

In the area of capital construction, the plan quotas envisage the primary channeling of capital investments, material, technical and labor resources into the technical reequipping and reconstruction of existing enterprises, reducing the number of newly started projects and the amount of incomplete construction as well as the inventories of uninstalled equipment. The technological structure of the state capital investments will be improved with the share of expenditures on equipment in the capital investments comprising around 42 percent.

The state capital investments in 1984 have been set at 129.4 billion rubles. Here the growth rates of the fixed capital put into operation will be 5.8 percent with a growth of 5.2 percent for the state capital investments.

The ultimate aim of the quotas in the plan for the development of the national economy in 1984 is a further rise in the standard of living of the people. Real per capita income will rise by 3.5 percent and the public consumption funds by 3.7 percent.

In 1984, housing will be built with a total area of 109 million m². This will be 6.6 percent more than the quotas of the five-year plan for 1984. The physical plant of education, public health as well as the service sphere for the population will undergo further development.

The party and government are paying constant attention to increasing production, to improving the assortment and quality of the commodities in mass demand as well as to broadening the volume and type of services rendered. However, as yet the level of supplying the public with individual goods and services, their quality as well as the level of service lag behind the needs of the Soviet people and cause legitimate complaints from the workers. In this context the Politburo of the CPSU Central Committee has felt it necessary to work out a comprehensive program for developing the production of consumer goods and a system of public services, bearing in mind the fullest satisfaction of the diverse needs and requests of the Soviet man. The program will be worked out as part of the 1986-1990 Five-Year Plan and the Basic Directions for the Economic and Social Development of the USSR for the Longer Run.

The successful implementation of the 1984 plan must be aided by the measures outlined both of an organizational and an economic sort. The ministries and departments have been instructed to pay basic attention to a fundamental improvement in the use of production capacity at the operating enterprises and to carry out specific measures to eliminate bottlenecks and remove the disproportions in the development of the related sectors and types of production and thereby increase the product production volume.

Of essential significance for carrying out the 1984 plan will be the decisions adopted by the party and the government to improve planning, management and

incentives. As was pointed out at the June (1983) Plenum of the CPSU Central Committee, to ensure smooth, continuous work of the entire economic mechanism is a problem for today and a program task for the future. "Of course, comrades," said Yu. V. Andropov, "in an economy of such a scale and such complexity as ours, it is essential to be strictly cautious. Here, as never before, the saying fits: measure seven times and cut once. For precisely this reason, in preparing for major decisions, we must endeavor to carefully study each question, we must resort to large-scale experiments in order calmly and without hurry to study how the proposed innovations will operate and how they will influence planning and labor discipline, labor productivity and the efficiency of social production as a whole."¹

The adopted decree of the CPSU Central Committee and USSR Council of Ministers "On Additional Measures to Broaden the Rights of Industrial Production Associations (Enterprises) in Planning and Management Activity and in Strengthening Their Responsibility for the Work Results" involves primarily the activities of the basic element in the management system of industry, that is, the production associations and enterprises where materials are directly created. The production associations and enterprises should organize their work in such a manner as to achieve a correct reconciling of state and collective interests proceeding from the priority of the interest of the entire state and the entire people.

As is known, even in 1965, measures were adopted aimed at more closely coordinating centralized planning with cost accounting incentives for enterprise operations, at increasing the incentive for the labor collectives to achieve high work indicators and the economic use of resources. Such an approach was further developed in the decree of the CPSU Central Committee and the USSR Council of Ministers adopted in 1979 and aimed at improving the economic mechanism. Experience in recent years has shown that the ways for improving the economic mechanism were correctly set. Definite positive results have been achieved.

At the same time, it has been discovered that in the management system there still is excessive control over the work of the associations and enterprises and their rights have been limited in using capital and the incentive system as well as in taking various economic decisions. All of this impedes the initiative of the associations and enterprises and reduces their interest in seeking out reserves for increasing production and improving its efficiency. For this reason the task was set of establishing those specific forms and methods of management which would free the associations and enterprises from excessive "meddling" with a simultaneous rise in their responsibility for the results of the work.

A major economic experiment is to be carried out in the associations and enterprises of five different industrial sectors: the USSR Ministry of Heavy and Transport Machine Building, the USSR Ministry of Electrical Equipment Industry, the Ukrainian Ministry of Food Industry, the Belorussian Ministry of Light Industry and the Lithuanian Ministry of Local Industry. Such an approach makes

¹ PRAVDA, 16 August 1983.

it possible to more fully consider the particular features of each sector and then generalize the positive experience and disseminate it to the enterprises of other ministries.

The essence of the experiment consists primarily in broadening the involvement of the associations and enterprises in working out the plans. For this purpose, the range of plan indicators set for them has been reduced, while the role of the contracts concluded by the enterprise (association) with its partners has been increased. Conditions have been created for increasing the interest and responsibility of the enterprises in working out tauter quotas which more fully consider their capabilities and reserves. In the experiment an important place has been given to economic norms which determine the measure of mutual dependence between the work results and the resources.

The tasks outlined by the 1984 plan are truly grandiose. But the broader the scale of these plans and our production tasks, "the more persons there should be the millions of whom must be involved in independent participation in carrying these tasks," commented V. I. Lenin.²

The socialist competition is an effective means for increasing the activity of the working masses aimed at carrying out the annual and five-year plans. A particular feature of this powerful lever for economic growth at the present stage lies in its scale and qualitative improvement. First of all, this has been caused by the development of production relations where the center of gravity has shifted from extensive, quantitative growth factors to intensive, qualitative management methods. Chief attention is being focused on accelerating the growth of labor productivity, improving product quality, increasing the production volume, on the unfailing fulfillment of deliveries under contracts and orders, on saving labor and material resources, on better utilizing production capacity, on introducing the achievements of scientific and technical progress into production, on improving the organization of production and on strengthening labor discipline.

The competition and the counterplans adopted by the labor collectives have begun to interact in a more organic manner. At present, it is particularly important that the counterplans be coordinated and securely linked with the capabilities of suppliers included in the system of subcontracting ties so that their participation ensures greater production efficiency and higher product quality.

The law adopted on the labor collectives and increasing their role in the management of the enterprises, institutions and organizations has created a firm base for more active involvement of the workers in management questions. All material values are created directly in the labor collective which is the basic cell of Soviet society, our plans are actually carried out in it, and the designated goals are realized. At present, all the key questions of production and social development at the enterprises should be solved with the active involvement of the labor collectives. Their role has been increased in working out and discussing the plans and in solving questions concerning the vital

² V. I. Lenin, PSS [Complete Collected Works], Vol 36, p 446.

activities of the collectives, including the setting of additional benefits and advantages for innovators, production pacesetters and so forth.

The successful carrying out of the 1984 plan, undoubtedly, involves the greatest possible rise in labor discipline. The successes of the pacesetters are largely ensured by the fact that in the collectives where they work, a strengthening of planning and labor discipline is viewed not as a brief campaign but rather as an essential condition for the clear organization of production. And where the matter is approached as if a campaign and they limit themselves to talking about the strengthening of discipline, labor productivity does not rise and the plans are not completely fulfilled.

Of great importance in this regard are the Decree of the CPSU Central Committee, the USSR Council of Ministers and the AUCCTU "On Strengthening Work in Improving Socialist Labor Discipline" and the Decree of the USSR Council of Ministers and the AUCCTU "On Additional Measures to Strengthen Labor Discipline."

The adopted documents have been dictated by the vital interests of our society and they express the firm will of the Soviet people. Socialist discipline is not merely the strict observance of the rules of inner order, but also a conscious, creative attitude toward one's work, the ensuring of its high quality and the productive use of working time. It is no secret that sometimes during working hours all sorts of meetings, rallies, sports contests, rehearsals of amateur artistic activities and tourist trips are held. At all enterprises and organizations, strict order must be imposed on these questions in accord with the current legislation.

Thus, in the course of carrying out the 1984 plan, basic attention will be focused on fulfilling the tasks which ensure the following: accelerating the growth rate of labor productivity by widely introducing scientific and technical achievements and advanced experience into practice so that on this basis the standard of living of the Soviet people is increased; the more rapid growth of the end results of production in comparison with the growth of expenditures on a basis of the strictest saving of fuel, energy, metal and other materials, as well as improving product quality; the fuller utilization of production capacity at operating enterprises; reducing the number of newly started projects and the amount of incomplete construction; accelerating the development and introduction of new machines, instruments and production methods and the consistent carrying out of a unified scientific and technical policy; increasing the production and procurement of agricultural products for carrying out the USSR Food Program; a further improvement in the organization and greater efficiency in the operation of all types of transport; creating material and financial reserves for ensuring the steady and rhythmical operation of the national economic sectors.

The Soviet people view the decisions of the December (1983) Plenum of the CPSU Central Committee and Session of the USSR Supreme Soviet as their vital concern and are ready not only to fulfill the quotas of the 1984 plan but also to overfulfill them, in being profoundly aware that the 1984 plan will establish the basis for successfully carrying out the tasks of the 11th Five-Year Plan as a whole and for elaborating the 12th Five-Year Plan for the nation's economic and social development.

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INVESTMENT, PRICES, BUDGET AND FINANCE

INDUSTRIAL STOCK, CAPITAL RESERVES FORMATION EXAMINED

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[Article by V. Shtundyuk, senior science associate at the Central Mathematical Economics Institute under the USSR Academy of Sciences: "On the Formation and Consumption of Material and Financial Reserves by Industrial Associations"]

[Text] The rapid and planned overcoming by enterprises of various difficulties which arise unexpectedly in the course of routine production and economic activities, increased reliability of economic calculations and the accelerating of production development rates involve the need to use material, technical and financial reserves for these purposes.

However, the establishing of these reserves at each enterprise in amounts sufficient for overcoming the arising difficulties is not only impossible due to the absence of the necessary resources for this but also is economically unjustified. Practice has shown that any attempts by certain enterprises to form surplus stocks as a "reinsurance" lead to the extended immobilizing of extensive materials, to the accumulating of some types and to a shortage of others. As a result, the enterprises, even those with significant stocks, still do not possess sufficient economic stability and in difficulties in the process of fulfilling the plan most often cannot independently provide production with the required resources. All of this determines the advisability of concentrating supplies on a level of a group of enterprises and creating material, technical and financial reserves in the all-Union and republic industrial associations.

With such a forming of reserves, the daily requirements of the enterprises can be satisfied without establishing supplies for each of them for the entire range of resources required by the economic bodies with a simultaneous rise in the reliability of material, technical and financial supply. K. Marx wrote that "the higher the social concentration of stocks the relatively less these outlays become."¹

An industrial association is the unit directly responsible for the functioning and development of the enterprises, it directly controls their activities, it helps the subordinate enterprises reinforce the achieved successes and in the

¹ K. Marx and F. Engels, "Soch." [Works], Vol 24, p 164.

event of the occurrence of difficulties to overcome them. Precisely the industrial associations should be the first link in the management hierarchy of industry which forms reserves to provide material or financial support to its structural subdivisions.

The industrial associations can form reserves with an integrated consideration of the entire aggregate of corresponding diverse factors, primarily the opportunities for combining the production processes, their intensification and the prompt withdrawal for repair of technologically interrelated groups of equipment from their various enterprises. The associations are capable of taking into account the particular features of the demand for various types of raw materials and other commodities, the amount of warehousing expenditures, the effect from combining material and monetary turnovers, the placement of the warehouse system and so forth. An industrial association knows the specific conditions for the operation of the departmental enterprises and periodically receives information on the course of this.

The management apparatus of an industrial association is directly in touch with the enterprises. For this reason at the industrial associations the utilizing of reserves should be carried out with proper effectiveness.

At the industrial associations the employing of reserves can be combined with the use of other cost accounting levers, such as: the varying of prices for products the circulation of which ends within the given association; the allocating of money from the centralized production development fund and the unified fund for scientific and technical development; the paying of remuneration for carrying out production assignments which are particularly important for the association as a whole. This makes it possible to merge the individual economic levers into a single force of economic influence on production and circulation, to effectively overcome the unfavorably developing trends and achieve economic progress. As a result, better conditions are provided for the optimum use of reserves and all other elements in the system of economic levers and maximum results are achieved with the minimum possible expenditures of the various economic elements.

The formation of reserves in the industrial production-economic complexes contributes also to the further development of cost accounting in the associations. The latter possess a sound material and financial base and for this reason can form reserves from their own planned and above-plan sources on the basis of the principle of covering costs. At the same time, since the associations accumulate resources during favorable periods of their operations for overcoming difficulties during other operational intervals, the reserves for economic regulation are an important means for ensuring and stabilizing their covering of costs. The maneuvering of reserves and the shifting of temporarily free funds from some enterprises to overcome failings in the activities of others stabilize payment turnover, they help to increase the operating results of each component part of the associations and they increase its material, technical and financial might as well as the degree of covering expenditures from the money received in the course of current operations. Moreover, this broadens operating independence of the associations and helps to fulfill the new functions in the production and commercial activities with a minimum outlay of time and forces as well as to strengthen such an important principle in

organizing cost accounting as ruble control in the production and economic systems. Here one other important quality of it is also developed: mutual control by the management of the association, enterprises, and other parts of the production and economic complex.

The material and financial reserves of the associations are an effective means for ensuring the proper production load on the equipment and for preventing its unplanned stoppages. Without dependable supplies it is impossible to fully utilize the advantages of the associations in establishing specialization and even, flow operations.

The industrial enterprises form the following types of reserves: wages, for raw materials, fuel, equipment and other material resources; credit; amortization deductions for major overhauls; financial assistance to the enterprises and economic organizations.

The wage reserve is created by setting aside a portion of the funds allocated to pay the workers. When necessary, these funds are channeled by the associations to replenish the wage funds of enterprises and other economic bodies, primarily with an increase in the output of products essential for the national economy, in developing the production of new products as well as in other instances involving an economically justified increase in production labor intensiveness.

The reserve of amortization deductions for major overhauls is spent to provide aid to enterprises and organizations when they do not have enough of their own resources for carrying out major overhauls on machinery and equipment. The total amount of the reserve should not exceed 15 percent of the association's amortization funds earmarked for major overhauls.

The reserve for raw materials, fuel, equipment and other material resources is formed as a result of reallocating a portion of the funds for material and technical supply allocated to the ministry as a whole. The basic areas for utilizing the given reserve by the association is to replenish the corresponding funds of the enterprises which have overfulfilled their production plans or are experiencing difficulties in raw products, materials and semifactures as a consequence of a change in the range of the produced products, an improvement in their quality and so forth.

The reserve for providing financial aid to the enterprises and economic organizations is formed from deductions made by the enterprises in an amount set for each of them. Loans are granted from the reserve to the enterprises experiencing temporary financial difficulties because of supply failures; the carrying out of measures helping to improve product quality; to the introduction of production capacity; to delays in the payment of bills for dispatched goods and so forth.

The credit reserve is a percentage left to the disposal of the association from the total credits allocated to it in accord with the credit plans of the USSR Gosbank and the USSR Srobybank.

Analysis shows that the correct formation and utilization of the material, technical and financial resources at the industrial associations have a positive impact upon all the activities of the production and economic complexes and help to realize their significant possibilities for increasing the efficiency of production and circulation. At the same time, the acquired experience also shows that the effect from the reserve funds of the industrial associations could be much greater. The achieving of a greater return is impeded by certain shortcomings in the current procedure for figuring and utilizing the reserve resources as well as in the practice of their employment.

Recently it has become a practice of figuring the amortization deductions earmarked for the repair of equipment during the first year of its operation as part of the fixed liabilities of working capital. Here they often refer to the fact that the fixed productive capital during the initial period of its employment does not require repair. Such an approach to a certain degree is reasonable. However, it is impossible to agree completely with this.

Even K. Marx pointed out that there are "infantile" and "elderly" diseases of equipment. The "elderly" technical wear is expressed initially in the form of unnoticed, covertly developing changes related chiefly to the evolution of the molecular state of the materials from which the equipment has been manufactured. These changes cannot always be measured but they then appear suddenly (breaks, cracks, burning out, ruptures and so forth). Insignificant and daily noticeable changes are characteristic for the initial period of operating the means of labor.

The complete depriving of the sectorial economic management bodies of monetary resources for the major overhaul of new equipment during the initial period of its operation forces them to cure the equipment of the "infantile" diseases using their own working capital or to put off carrying out such repair work. The latter, naturally, leads to the premature wearing out of the fixed capital, to the overexpenditure of money for rebuilding it and to a distorting of the process of forming and utilizing the amortization deduction reserve for major overhauls. In compiling the financial plans of the ministries and their industrial associations, it would be advisable to specifically ascertain the funds necessary for the repair of the means of labor during the first year of their operation and use the difference between the total amortization deductions for the major overhaul of the corresponding equipment and the estimated expenditures for carrying this out on increasing the fixed liabilities.

In individual industrial sectors, the difficulties in forming reserve amortization deductions for major overhaul and in employing them in accord with their specific purpose are caused by an increase in the relative amount of the wear on fixed productive capital in its total value due to a decline in the replacement rate of the means of labor.

Eliminating a number of shortcomings in the practices of forming and utilizing the amortization deductions would help to increase the return from the amortization deduction reserve for major overhauls. Thus, the confiscating and additional allocating of amortization resources far from always are carried out in accord with the financial plan. Often the free funds for major overhauls at some enterprises are mechanically turned over to other plants and factories.

At many enterprises and production associations the expenditures on major overhauls are covered from the corresponding special account not as these are actually made but only for completed projects. Offset operations have still been little developed in planned transfers of funds for amortization from the payment account to the corresponding special account and in transferring money from the latter for major overhauls carried out by the direct labor method. This accelerates the accumulating of amortization funds in the special accounts, it creates better conditions for forming an amortization reserve and providing monetary support to the enterprises in carrying out planned repairs and also reduces labor expenditures on drawing up the payment documents.

The unjustified confiscation of the corresponding funds for financing state capital investments also reduces the effectiveness of forming and utilizing the amortization deduction reserve for major overhauls.

At present, a certain portion of the amortization deductions earmarked for major overhauls is channeled by the enterprises and production-economic complexes into financing road construction although these are resources with a strictly designated purpose. A shortage of them tells negatively on the operation of equipment and on the fulfilling of the state plan quotas. Such a practice also impedes the forming of the proper size of a reserve of amortization deductions for modernization. For this reason, obviously, it would be advisable not to divert the given resources into the construction and repair of the local road network. The shortage of funds arising as a result of this can be made up by the corresponding deductions from the production development fund of the economic bodies. This measure will help not only to better maintain the equipment in a working state and create better conditions for the maneuvering of the amortization deductions but will also increase the incentive of the local bodies to have the enterprises and associations operate effectively.

The increased cost of repairs caused by the incorrect operation of the equipment as well as the insufficient amount of repairs carried out by specialized, technically equipped contracting organizations seriously impede the forming of an amortization deduction reserve for renovation in the planned amount and the satisfying from it of the justified emergency needs of the plants and factories for money to overhaul the equipment.

Sometimes the nonfulfillment of the repair plan is caused by the delayed transfer by the associations of money to the special account for the financing of major overhauls due to monetary difficulties being experienced by them. The Kemerovo Azot [Nitrogen] Production Association for this reason was unable to transfer to the special account for financing major overhauls just 12,666,000 rubles instead of the planned 14,944,000; the Kemerovo Karbolit [Carbolite] Production Association instead of the planned 2,827,000 rubles was able to transfer only 2,049,000; at the Krasnoyarsklesprom [Krasnoyarsk Lumber Industry] Association, the shortfall of amortization deductions for major overhauls was 4 million rubles.

Instances have been observed of a shortage of funds for financing major overhauls also as a result of utilizing these funds improperly, for example, for unplanned construction.

The lengthening of the time and the reduced quality of repairs, the lack of amortization deductions for modernization and the reduced opportunities for forming reserve funds for repairs in a number of associations have been caused by a change in the title lists of the projects to be rebuilt and in the major overhaul plans, by carrying out repairs without approved estimates and determined financing sources as well as by other factors related to shortcomings in the organization of the repair system. Thus, in a check carried out by the Altay Kray office of the Gosbank on the financing of repairs at 268 economic organizations, 13 instances were disclosed of carrying out repairs without approved estimates (totaling 147,000 rubles) and 9 instances of repairs not provided for in the plan (totaling 161,000 rubles).

The reserve of amortization deductions for major overhauls and subsidies to the enterprises from it can become important levers for increasing the effectiveness of repairs, that is, for fulfilling the repair plan, reducing the costs and improving quality. For this the accumulating of reserve amortization resources for modernization in the industrial associations and their allocation to the enterprises must be combined with analytical work to study the annual plans for overhauling the production facilities of the plants and factories, the corresponding estimate and technical documents, the financial plans and, in particular, the completeness of the calculations for amortization repair deductions. Particular attention must be given to analyses of the quantitative and qualitative indicators for the actual course of major overhauls and the reasons for their deviation from the planned parameters, the amount of incomplete repairs, the degree of concentrating the material, labor and financial resources at the repair projects.

It is also essential to solve certain questions in the area of the formation and use of the money in the wage reserve. Analysis shows that often the industrial associations allow a major overexpenditure in the wage fund as a consequence of shortcomings in planning the labor indicators, because of delays in issuing them to the enterprises, surprise changes and the exceeding of the limit for the number of personnel, including the administrative and management. Very widespread are the reasons for the unjustified exceeding of the planned wage fund, including: the poor organization of labor; shortcomings in labor norming; violations of the planned dates for converting to new output rates; the output of poor quality products; all sorts of additional payments not caused by objective work features, in particular for overtime, and other phenomena of mismanagement and waste in distributing and utilizing the funds allocated to pay the workers. At times, the overexpenditure due to the unproductive payment of personnel is fully or partially covered by the resources in the wage reserve. As a result, the reserve is turned from a means which should help in ensuring normal conditions for fulfilling the plan with a change in production labor intensiveness due to factors which do not depend upon the labor collective into an implement for covering operational shortcomings. It would be advisable that the banking institutions went more deeply into the specific reasons for the association's granting of money to the enterprises from the wage fund. If the granting of a subsidy from the reserve was due to errors in the organization of production and labor, the bank should not accept the payment demand from the association to transfer additional funds to the departmental subdivision for paying the production personnel. It must view the arising deficit as

an overexpenditure of the wage fund and seek its elimination by the enterprise's forces by carrying out the appropriate organizational and technical measures.

Banking control over the validity of the granting of money to the enterprises from the wage fund of an industrial association and the bank's effect on the enterprises in the aim of ensuring a maximum economy of the monetary resources going to pay the wages and the observing of the economically sound ratio between the growth rate of wages and labor productivity should be flexible and carried out considering the entire most complex diversity of conditions in production and economic activities. In line with this it would be correct if the banking bodies in such instances when the overexpenditure for wages was caused by a random, one-time factor, could take a decision to cover this from the reserve funds which could be transferred by the industrial association. Under such circumstances, the bank, at its discretion, could settle the question of the grounds for providing aid from the wage fund and namely whether this is to be done gratis or with the subsequent return of the money by the enterprise to the association from the savings obtained in the wage fund as a result of the measures adopted by the enterprise to increase the effective use of working time.

Simultaneously, for increasing the effective operation of the wage reserve, the money from it must be allocated to the enterprises not mechanically but rather after they have submitted an explanation as to the specific reasons leading to increased expenditures on personnel wages as well as an approved plan of measures to reduce production labor intensiveness and provide compensation for the money obtained from the reserve. The plan should indicate the dates for carrying out each measure; the related necessary expenditures; the sources of their recovery; the economy to be obtained, in particular for wages; persons are to be named who are responsible for carrying out the planned measures. The granting of subsidies to the enterprises from the wage reserve should impose definite obligations also on the management of the industrial association. This is primarily a check on the actual need of the enterprises for additional funds to pay wages, the realisticness of their measures to reduce the labor intensiveness of the produced product and the monitoring of their implementation and the correct use of the reserve funds.

The financial aid reserve should be formed not only from the planned and above-plan profit but also to a certain degree from the own working capital of the enterprises which are part of the industrial associations. The channeling of a portion of the working capital from the economic bodies into the given reserve will help to strengthen the interest of the latter in accelerating the turnover rate of the material and monetary resources and better utilize the reserve funds. In addition, this will also strengthen the financial base of their formation in quantitative and qualitative terms.

At present, in the industrial associations the deductions from the enterprises to the financial aid reserve are made once a quarter. At the same time, the temporary surplus money arising for the enterprises as a consequence of debts (for unbilled deliveries; for deliveries under clearance payment documents for which the payment date has not come due due to the great time gap between receiving the good and its payment; to financial bodies for the turnover tax and

so forth) are not employed during the quarter. But the association's management due to various circumstances does not always have money at the essential moment for providing aid to the enterprises which are experiencing monetary difficulties, regardless of their good operation. For this reason it would be useful to move from the quarterly formation of the financial aid reserve to a monthly one.

Often in compiling the financial plans for the industrial sectors, the money for forming the financial aid reserve is set in an amount less than the established norm.

The financial aid reserve for the enterprises and organizations makes it possible, with relatively insignificant amounts of money, to eliminate blockages in the movement of large amounts of money and accelerates payment turnover. For this reason, the financial aid reserve must be formed in strict accord with the established norms. If financing sources are not sufficient for this at one time, the deficit can be covered by a corresponding reduction in the planned working capital norm as a consequence of accelerating the turnover rate of the working capital resulting from the setting up of the reserve.

Ensuring the prompt providing of financial aid to the enterprises, its specific nature and the observance of the established dates for the repayment of the loans received by them to the financial aid reserve of the industrial association, the early accumulating of the necessary money by the association and a qualitative improvement in the level of managing the reserve monetary resources can be achieved only if the industrial production-economic complex has reliable and sufficiently concrete information for the next 10-15 days on the monetary requirements of the subordinate economic bodies, their monetary receipts and the financial situation formed on this basis. For this, it is essential in every possible way to develop financial planning at the enterprises and production associations as well as draw up calendar schedules for payments and the receipt of funds.

Obviously, a lack of money for the enterprises and production associations should not be mechanically covered from the resources of the financial aid reserve of the industrial association. It should be covered by mobilizing all the existing internal possibilities of the economic bodies and namely: the collecting of debts, the selling of above-planned commodities and materials which are unnecessary for production, accelerating the dispatch of products to purchasers and the sending out of bills for them, seeking bank loans, eliminating rush work and so forth. Only in an extreme case, basically when the lack of payment resources has actually been caused by factors not depending upon the enterprise can the reserve funds of the industrial association be employed to eliminate the short-term payment gap.

It is essential that the use of the reserve financial resources in the industrial associations take into account payment turnover and ensure the maximum possible return per ruble of funds invested into the monetary reserves. Preference should be given to the well-operating enterprises which have experienced a temporary shortage of money for reasons which do not depend upon their operations. Measures carried out in the interests of the entire industrial association or a group of subdivisions comprising it are among the primary ones to be subsidized from money in the financial aid reserve. The funds of the financial

aid reserve should be given high priority in preventing arrears in the primary unit of their occurrence in order to prevent a chain reaction of arrears in the entire industrial association or a substantial part of it. It is advisable to grant the enterprises a portion of financial loans by carrying out competitions which would disclose the following: the importance of the measures to be carried out for fulfilling the plan quotas and developing the industrial association as a whole; the economic effect to be obtained as a result of using the reserve funds; the time for retiring the loan.

It is very important to have an integrated approach to the choice of the projects as well as the areas of applying the monetary reserves, considering the most rational sequence for eliminating the various economic complications. Thus, initially an association grants a loan to an enterprise which has the most surplus working capital immobilized in excessive commodity and material stocks. The aid is provided for a time needed to free up the monetary resources. The "unfrozen" money in accord with the elaborated program is turned over to another enterprise of the association which at the given time will provide its most effective employment from the standpoint of the production and economic system as a whole, and so forth.

A lack of own monetary resources among the industrial associations is caused, in particular, by the shortcomings in the method of calculating their norms. Thus, in setting the working capital norms of the enterprises, consideration is not given to the increased outlays on producing new types of product and covered from the unified scientific and technical development fund. In 1983, at the industrial associations of the Minsel'khoz mash [Ministry of Tractor and Agricultural Machine Building], these expenditures should reach around 70 million rubles while the total shortfall for working capital for the above-given reason will be 6.8 million rubles.

The method of determining the working capital norm is far from being fully worked out and this at times also causes financial difficulties for the industrial associations. Thus, in many instances, along with autonomous enterprises the associations also include production associations which have production units that do not operate on an independent balance sheet. The articles (assemblies, parts, stock and so forth) supplied to the latter under subcontracting arrangements within the association are shown on the balance sheet of the head plant as carryovers of incomplete production. Such internal deliveries are not taken into account in setting the working capital norm of the production associations. The financial difficulties caused by the given circumstance, as a consequence of the deepening of the division of labor within the production association, require the incorporating of clarifications in the procedure for setting the norm of its working capital.

The role, importance and effectiveness of the financial aid reserve are also weakened by the practice at many industrial associations of the unjustified confiscation over the year (in violation of the set regulations) of working capital from the efficiently operating enterprises for the enterprises which have permitted the improper use of their money. At times, financial breaches occur due to changes in the profit quotas in the course of production and economic activities and to the differentiating of the capital payment rates for the economic bodies. Thus, the industrial associations of the Minzhivmash

[Ministry of Machine Building for Animal Husbandry and Fodder Production] during the year had their quota for profit and payments to the budget reduced by 7 million rubles in the first quarter with a corresponding increase in the third and fourth quarters. For a number of enterprises in these associations, the rates for the productive capital payment were reduced without sufficient justification while some of them were completely released from this type of payment to the state. At the same time, there were instances of an unjustified routine increase in the enterprise working capital.

The improved financial status of the enterprises and their strengthened payment discipline to a large degree would be aided by eliminating such frequently encountered shortcomings as the delayed or incomplete transferral to them by the industrial association's management of the required money in accord with the income and expenditure balance, the failure to draw up various specific banking credits, overexpenditures for the special and overpayments to the budget.

The financial difficulties of the enterprises and associations and the lack of funds for forming the normed financial aid reserve for the enterprises and organizations and providing them with the corresponding support at the necessary moment are sometimes related to stockpiled raw products and materials which at times are unneeded by them and to delays in their sale.

At times, the enterprises do not carry out their set quotas for putting above-norm commodity stocks into economic circulation and in a number of instances allow their further growth.

Having an equally negative effect on the use of the financial aid reserve for the enterprises and organizations are such factors as the nonfulfillment of the product output plans permitted by certain industrial associations in individual periods, the great nonproductive expenditures and losses and even the growth of such expenditures in comparison with the previous period and delays in paying submitted bills.

The incomplete and disproportional completion of new production capacity, delays in reaching full capacity and shortcomings in the use of operating equipment influence the circulation of material and monetary resources, they increase planned product costs and worsen the financial situation. Thus, in the first half of 1982, at the Pskovstroyaterialy [Pskov Building Materials] Production Association, the level of reaching designed capacity for manufacturing clinker was just 17.7 percent. This led to a decline in the output volume by 10,700 tons, to a substantial decline in production profitability and to a slowdown in the turnover rate of the working capital. A very widespread reason for reduced effectiveness in the use of the money of the financial aid reserve for the enterprises and organizations in the industrial associations is the failure to properly increase working resources in developing new types of products by the enterprises and production associations, in increasing their quality and thereby lengthening the duration of the production cycle. Thus, in 1982, the Zhdanov Machine Building Association (Zhdanovtyazhmash) converted to the production of a new product and this led to an increase in the own working capital norm by 5 million rubles. The association was unable to replenish its monetary resources out of its own profit and the ministry was also unable to

supply this. As a result of developing the new product, the association ended up in a very tight financial situation. At the Krasnoyarsk Heavy Machine Building Association (Sibtyazhmash), extensive start-up work was carried out involving the new production of the EKG-12.5 excavators and rotary complexes. The manufacturing cycle for this equipment is over a year. In the 1982 financial plan, the association's working capital norm was set at 6,136,000 rubles while actual expenditures as of 1 July of the same year were 6,669,600 rubles.

At certain industrial associations, stoppages in the circulation of working capital, an unjustified increase in the demand of the enterprises for resources from the financial aid reserve for the enterprises and organizations and a weakening of its regulating role have been caused by the "freezing" of a substantial part of the money in above-norm unsaleable finished product. Thus, on 1 January 1982, in Rostrikotazhprom [Rostov Knitwear Industry Association], with a storage standard of 6 days, the finished products actually remained 19.9 days at the warehouses of the Ishimbay Knitwear Mill, 28.6 days at the Yoshkar-Ola Knitwear Mill, 46.9 days at the Nazran Knitwear Mill and 24.5 days at the Ruzayevka Garment Knitwear Mill.

Sometimes the enterprises, because of various factors, end up in a difficult financial situation. The industrial association is capable of providing funds for quickly bringing them out of a financial problem, in particular, repaying bank debts on this basis. Some time is required to transfer the money. Delays in the receipt of funds can further worsen the financial situation of an economic body, increase overdue debts and lead to the spread of arrears to other structural elements in the given industrial production-economic system. At the same time, in accord with the established procedure, bank loans are not provided for funds being transferred to enterprises from the association's reserves. For the accelerated carrying out of beneficial financial measures and for localizing financial breakdowns at the areas of their occurrence, it would be correct to grant the enterprises short-term bank loans for funds allocated under the provisions of providing financial aid. For ensuring the return of these credits on the stipulated dates, these should be granted to the enterprises under the guarantee of the industrial association. At the same time, for the same purposes, the banking institutions when necessary should be able to write off uncontested the corresponding amounts from the account of the association or enterprise, if its resources are to be employed for providing the corresponding monetary support for an economic body which has gotten into financial difficulties.

Establishing in each industrial sector uniform and compulsory calendar dates for all the structural parts comprising it for forming the reserves of the industrial associations would be a measure helping to develop accounting operations in redistributing the money between the enterprises for the various specific purposes, to reduce the labor intensiveness of drawing up the corresponding transfers, for strengthening control over their correct implementation and for accelerating the receipt of the money in the reserves.

Serious attention should be given to the proposal of certain managers and economists to broaden the system of industrial association reserves. Thus, very viable are the recommendations for forming reserves in the associations for carrying out contractual obligations relating to product deliveries and satisfying the above-plan needs of consumers; carrying out exploratory scientific

research, enterprising and unplanned scientific and technical developments; covering claims from clients for ineffective developments.

In our opinion, the study and generalization by scientists, managers and economists of the experience acquired by industrial associations in forming and utilizing the reserve funds and the broad discussion of this in the press will make it possible to make the necessary adjustments in the corresponding enforceable enactments and significantly improve the actual employment of the reserves. This, in turn, will help to raise the level of economic activities in this important element of the economy.

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INVESTMENT, PRICE, BUDGET AND FINANCE

UKRAINIAN ECONOMIST EVALUATES INVESTMENT VARIANTS

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 12, Dec 83 pp 65-71

[Article by Yu. Kushchevskiy, leading economist of Dnepropetrovsk branch of Institute of Economics of Industry of the UkSSR Academy of Sciences: "Evaluation of Comparative Effectiveness of Modernization Variants"]

[Text] A characteristic feature of the current five-year plan is to be found in increased demands on effectiveness of utilization of capital investment and fixed production capital. Reduced growth of capital investment in relation to planned growth of the national income would shift the center of gravity in development of the economy to fuller utilization of the production apparatus with limitation of expenditures on the construction of new enterprises and expansion of existing ones.

In prior five-year plans, it was not always possible during the creation of tremendous production capacity to renew in a timely way functioning fixed capital. As a result, the latter aged, the time periods of their renewal were frequently violated, holding back adoption of the achievements of scientific-technical progress in production. For this reason, speeding up of replacement of obsolete and physically worn means of labor is becoming an urgent task.

Technical improvement of production presupposes not just a simple replacement of old with comparable new equipment but wide-scale qualitative renewal of worn out means of labor with rebuilding of the passive portion of fixed capital needed for the use of equipment of a higher level. It is namely such renewal that is characteristic of modernization, which is not restricted to restoration of fixed capital but is accompanied by the growth of capacities of existing enterprises and stronger concentration of production.

In the modernization process, simple reproduction of fixed capital is combined with expansion. In this connection identical results may occur with different retirement and renewal of the means of labor. This complicates calculations of the comparative effectiveness of modernization variants and calls for a special approach to the economic validation of renewal of fixed capital of operative production.

According to the Standard Method of Determining Economic Effectiveness of Capital Investment, in a comparison of modernization variants, the best of

them is minimum of adduced expenditures. The minimum of adduced expenditures is used in the selection of a new-construction variant. But in that case it is simpler to assess comparative effectiveness inasmuch as practically all investment in new construction goes into expanded reproduction of fixed capital, while in modernization a part of the investment is used for the purpose of simple reproduction for the compensation of retired means of labor. Furthermore, in the course of reconstruction fixed capital is often retired that could still function. The Standard Method recommends that the residual value of the fixed capital (after deduction of the sum of realization) be added to the corresponding capital investment going into modernization.

In distinction to new construction, the volume of capital investment for modernization is determined by expenditures not only for expanded reproduction of fixed capital but also for compensation of the balance value of retired means of labor. It can be seen from this that the developed procedure of assigning the balance value of retired capital and expenditures on modernization gives preference in evaluating comparative effectiveness to the selection of variants providing for preservation of worn out means of labor that operated prior to modernization. This is not in accord with the chief requirement for modernization--timely and maximally broad renewal of functioning means of labor on the basis of the latest technology and, what is most important, it does not reflect the real economic advantages of variants taking into account the need for such renewal.

The correctness of this assertion can be proved on the example of variants that differ extremely in regard to the use of investment for simple and expanded reproduction of fixed capital. Let us examine two variants of modernization of a facility whose fixed capital is valued at 10 million rubles that puts out 20 million rubles worth of products with a production cost of 18 million rubles. Both of them provide for a reduction of production cost by 0.8 million rubles without changing production volume and with identical calculated capital investment (5 million rubles). In the first variant, it is planned to apply all investment for the startup of new fixed capital, while in the second--for the replacement of worn out equipment with a residual value of 1 million rubles and a balance value of 5 million rubles. The cited expenditures in the variants are identical. Consequently both of them will be recognized as of equal value economically. In reality, however, the second variant, entailing the renewal of fixed capital, possesses manifest economic advantages that are not considered in the adduced expenditures.

First, with equal volumes of calculated investment, actual capital expenditures in the second variant will be 1 million rubles less than in the first, or in the amount of the size of residual value of the retired capital, which is added to the newly put in investment.

Second, the value of the fixed production capital of the facility being modernized does not change following realization of the second variant, but in the case of execution of the first variant grows by 5 million rubles according to the conditions of our example and will amount to 15 million rubles. The yield on capital in the first variant will be approximately 33.4 percent lower, while the capital requirement will be correspondingly higher with retention of a

large quantity of obsolete machinery and equipment, which will require of the cost accounting section additional deductions for production accumulation in the form of payment for capital and expenditures connected with the formation of the production-development fund.

Third, the operational life of a modernized facility is directly connected to the scale of fixed-capital renewal, and in this case it should be higher in the case of realization of the second modernization variant, which provides for the replacement of worn out means of labor. Taking into consideration the time of functioning of the fixed capital, the execution of the second variant will make it possible to obtain with lower construction costs and deductions for production accumulation a considerably bigger net product per unit of newly put in investment.

Fourth, in connection with the elimination of a part of the obsolete means of labor indicated in the second modernization variant, no outlays will be spent in the future on its restoration and for this reason the amortization deductions accumulated for the retired capital will serve as additional income for the national economy, which could be utilized for the technical improvement of production.

What has been described attests to the fact that the adduced expenditures manifestly inadequately take into account the influence of differences in the renewal of fixed capital for the comparative effectiveness of the modernization variants. In the case of existence of the pointed out differences, the use of the adduced expenditures would lead to the violation of the well-known principle of selection of investment variants on the basis of the need of comparing future expenditures on the modernized facility.

The chief reason lies here in our opinion in the artificial separation of evaluation of comparative effectiveness for adduced expenditures from the real conditions of reproduction and use of fixed capital following modernization. As we know, fixed capital represents embodied capital investment, and the higher effectiveness of the latter is closely connected with improved utilization of the fixed capital. In distinction to capitalist firms where the main motive is growth of the norm of profit for capital, socialist society is interested in increasing the entire physical volume of the national income calculated for used fixed capital. This requires primary realization of investment variants aimed at reducing capital intensiveness of public production and reduction of accumulation in regard to the comparable growth of the national income.

Such a requirement on the selection of investment variants is expressed through the norm of effectiveness characterizing the minimum limit of necessary annual growth of the net product per unit of accumulation permitted by society. For most sectors the norm of effectiveness reflects that size of production accumulation in regard to used fixed capital which provides for the need of expanded reproduction.

Some people believe that the norm of effectiveness in adduced expenditures takes into account the necessity of reducing the capital intensiveness of industrial production. But with the use of adduced expenditures this feature

of the norm is fully realized only with the observance in each variant of a sufficiently complete correspondence between the indicators of the all fixed capital output ratio [kapitaloyemkost'] and the fixed production capital output ratio [fondoyemkost'] of production of the object of investment. Thus, in a comparison of variants of new construction or expansion, when practically all investment becomes new capital and intervariant differences between capital intensiveness and resource investment or production are practically identical, the comparative effectiveness of investment is essentially determined by selection of the best variant of utilization of new production capital. In these cases, the use of adduced expenditures does not provoke any objections as it permits in identical measure to take into account the need for the reduction of the fixed production capital output ratio and fixed capital output ratio of production. But in a comparison of modernization variants, because of different use of investment for simple and expanded reproduction of fixed capital, the correspondence between capital intensiveness and resource intensiveness of the added volume of production is frequently disrupted and one may get less profitable and more resource intensive variants for the adduced expenditures. This applies in particular to those cases where less capital-intensive variants are at the same time more resource intensive because of retention in operation of inefficiently used obsolete means of labor.

For the purpose of eliminating the noted defects of adduced expenditures, the first condition for obtaining a more objective evaluation of the comparative effectiveness of the modernization variants is in our opinion the consideration only of fixed capital in expended reproduction with the exclusion of that part of the funds which are earmarked to be used for simple reproduction. This makes it possible to coordinate the evaluation of modernization with the change in resource intensiveness of production at the object of investment and to have the calculations aim at selecting a variant that provides better utilization of fixed capital. Such a possibility is caused by the fact that a monetary assessment of growth of fixed capital after modernization is determined in practice by the sum of capital investment for expanded reproduction.

The comparative effectiveness of the modernization variants depends on the size of the production cost and normative expenditures on expanded fixed-capital production of the object of investment. Under concrete conditions of management, these normative outlays approximately, but specifically in really existing amounts, chiefly express annual expenditures of enterprises on production accumulation not considered in the production cost: payment for capital and bank credit, deductions from profit for the formation of a production-development fund. Consequently, the sum of normative outlays and production cost should be rightfully called the indicator of full production outlays in which are reflected all annual expenditures of enterprises for production output and production accumulation. This indicator in full measure characterizes future annual expenditures at the place of investment, which is of major importance to the estimation of the comparative effectiveness of the modernization variants.

At first glance, taking into consideration the practice of using amortization deductions for the expanded reproduction of fixed capital, it may seem that expenditures of enterprises on production accumulation are already sufficiently

reflected in the production cost. But in that measure in which the expansion of public production is accomplished through the renewal of an already created production apparatus by means of modernization and reequipping of enterprises, the role of amortization as a source of expanded reproduction will grow, while the requirements for production accumulation through the means of the surplus product, other conditions being equal, are reduced, as a result of which absolute growth of accumulation in the national income takes place.

In turn, with growth of accumulation the possibilities are expanded of the use in production of variants involving more expensive and better equipment. As a consequence of this, the permissible size of the norm of effective investment should grow smaller. From these positions, the inclusion of amortization in the production cost should in no measure replace the accounting through the norm of effectiveness of the real annual expenditures of enterprises on production accumulation.

Production accumulation depends, as we know, on the return on fixed production capital or on the reciprocal amount--capital requirement of production. Reduction of yield on capital contributes to growth of production accumulation and growth--to its drop. In the selection of a variant with a higher capital-output ratio from variants compared as to volume of production, it is important to keep in mind that growth of the net product through the means of additional investment is accompanied at the given facility by a relative increase of fixed-capital volume and a reduction of its yield. For this reason, the real effect of selection of a variant with a higher capital-output ratio is provided given the condition where the relative growth of the net product due to production cost savings will cover the additional yearly outlays on production accumulation brought on by a reduction of yield on capital.

Inasmuch as at a modernized facility all yearly expenditures on production output and production accumulation are expressed as full production outlays, then in regard to the less capital-intensive variant, real annual growth of the net product with the selection of a more fund-intensive variant is determined as the more economical of these expenditures. The economy in practice consists of the difference of the adduced expenditures computed while taking into account the normative effectiveness of investment in the expanded reproduction of the fixed capital of the modernized facility.

The use of indicators of adduced and full production expenditures will make it possible to obtain comparable results of assessing comparable effectiveness in those rare cases where the necessary correspondence is maintained in each of the compared variants between indicators of capital intensiveness and resource intensiveness of production. But frequently the more fixed capital intensive modernization variants are at the same time less monetary capital intensive and vice versa. The more (or less) fixed capital intensive variants can also be more (or less) capital intensive, but with dissimilar intervariant differences between fixed capital intensiveness and monetary capital intensiveness. Under these conditions, in our view, in determining the comparative effectiveness of investment, it is not enough to direct one's attention to adduced expenditures, which only take into account reduced production cost at the modernized facility.

For the purpose of illustrating what has been said, let us turn to the above-described example. When evaluating according to the criterion here of production cost, adduced expenditures, the year's economic results and the coefficient of effectiveness of calculated capital investments are the same for both variants. But such an evaluation does not take into consideration the different fixed capital intensiveness of the variants as if the indicator of fixed capital intensiveness did not influence the comparative effectiveness of investment. Evidently in determining the anticipated year's economic results for the compared investment variants, it is necessary in addition to production cost to take into account any change in the fixed capital intensiveness of production at the modernized facility. With an unchanged production volume according to the conditions of our example, the modernization effect is determined by the differences of the indicators of full production expenditures before and after modernization.

Thus from the position of the interests of the costaccounting section, for the purpose of determining the best modernization variant, making it possible to provide greater growth of the net product per unit of investment, it would be preferable to use not the indicator of adduced expenditures but the full production expenditures. At the same time, inasmuch as the latter reflect only direct investment for putting new capital into operation, it is necessary from the national-economic point of view to take into consideration for a more objective evaluation of modernization effectiveness both capital investment in simple reproduction of fixed capital and also additional investment in related sectors. This makes it possible in calculations of comparative effectiveness to take into consideration the economic advantages of selecting less capital intensive modernization variants. Taking into consideration the objectively existing insufficiency of capital investment in the national economy, such a choice releases a portion of the resources which could be utilized at other sectors of production and provide a greater growth of the net product than at the given facility.

The size of these resources is determined while taking into account the savings of direct and interrelated investment achieved in the case of preference for a less capital-intensive variant. Evaluation of the sum of interrelated investment for the compared variants is done on the basis of existing norms of specific capital expenditures in related sectors supplying the corresponding elements of working capital to a facility undergoing modernization.

A second condition of objective evaluation of comparative effectiveness is in our view the determination of the latter not in isolation for the individual object of investment but within the system of industrial facilities of the national economy. This means that the selection of a more capital intensive variant is economically feasible only in the case where the attained relative economy of the sum of full production expenditures at a modernization facility exceeds growth of the net product in other production sectors because of additional investment released in the case of the less capital intensive variant.

From what has been said, it does not at all follow that it is possible to use for adoption the more capital intensive variant at the modernized facility ensuring a larger annual growth of the net product than the annual effect of

additional investment obtained with the selection of a less capital intensive variant. If the realization of the more capital intensive variant takes much time and is accompanied by an inadequate period of operation of the modernized capital, the economic practicability is not excluded of selecting a less capital intensive variant. Consequently, the third and last condition of an objective evaluation of the effectiveness of modernization is the need of taking into account the joint influence of differences in the service life of a modernized facility and the duration of the period of assimilation of investment. This will make it possible to better reflect the economic advantages of the variants that provide a broader renewal of fixed capital at the facility being modernized.

The given conditions are taken into account in the proposed method of evaluating the effectiveness of modernization variants, making it possible to select a variant that provides maximum growth of the net product per unit of investment in the system of industrial facilities of the national economy. The evaluation is made by a comparison of the relative growth of the net product at a modernized facility through economy of full production expenditures with the selection of a capital intensive variant with possible growth of the net product at other production sectors as the result of using additional investment released in the case of preference of a less capital-intensive variant. Comparative effectiveness is determined with the use of the norm of effectiveness of expenditures while taking into account the time of assimilation of investment and the average service life of the fixed capital of a modernized facility on the basis of variants.

We shall illustrate the depicted method using for an example possible planned solutions for the development of a an open-hearth furnace shop at Makeyevka Metallurgical Plant. The shops includes 11 open-hearth furnaces yielding about 4 million tons of steel a year. All of them are adapted for intensification of the smelting process by blowing oxygen through the metal bath. As a result of this, it was possible to double the steel yield of a furnace. But the productivity of the other furnaces is limited not by the rate of the smelting process but by a low throughput capacity of the shop's servicing sectors, resulting in the untimely delivery of a hard charge and liquid cast iron and in delays at the time of cleaning out products of smelting.

Let us analyze the following variants of development of the shop. The first of them provides for the attainment of a number of modernization measures for increasing the output of steel in the existing furnaces and improving labor conditions. The second variant proposes replacement of all the furnaces with 5 high-efficiency 2-bath steel-smelting units.

Each variant is intended to increase annual output of steel at the shop to 4.5 million tons (taking into account the ingot needs of the plant's rolling mills). The time of assimilation of investment for both variants is taken to be equal to one year. The modernization of the units is carried out during the time of cold repairs of the furnaces, which makes it possible to avoid losses in smelting steel.

Realization of the first variant, which envisages provision of conditions for boosting intensification of steel output in the furnaces through improvement of the organization of feeding the metal charge and pouring the steel will

Table

Indicator	Modernization variants	
	I	II
Yearly steel output, thousands of tons	4,500.0	4,500.0
Production cost of yearly output, millions of rubles	344.7	343.1
Outlays on shop's modernization, millions of rubles	12.5	5.5
Balance value of retired capital, millions of rubles	---	10.5
Interrelated capital investment, millions of rubles	111.6	136.7
Adduced expenditures, taking into account interrelated investment, millions of rubles	359.6	360.2
Plant capital intensiveness per ton of steel, millions of rubles	21.1	17.6
Full production expenditures on steel output, millions of rubles	356.1	352.6

require 12.6 million rubles of capital outlays for the installation of additional equipment and expansion of the shop building. The number of workers will practically be unchanged, but the plant's capital intensiveness of steel will increase 2.4 percent. The length of time required for complete physical wearing out of the basic production equipment after modernization of the shop is estimated at 7 years for this variant.

The installation of two-bath furnaces in place of the open-hearth furnaces will make it possible to withdraw from operation the greater portion of the obsolete furnaces and some equipment, to release a considerable area and to improve production organization without expansion of the shop building. Capital outlays on the realization of this variant are relatively small (5.5 million rubles), while the plant's capital intensiveness of steel as a consequence of the removal of a portion of the fixed capital will be reduced by 14.6 percent. The production cost of a ton of steel will be reduced by 1.2 percent. The number of the shop's workers will be reduced by 105 persons as a result of the release of a portion of the personnel servicing the furnaces. Complete physical wearing out of the basic production equipment following replacement of the open-hearth furnaces with the two-bath furnaces will occur in 10 years. At the same time, the operation of the two-bath furnaces is characterized by a higher proportionate cost of the metal charge for smelting the steel, which will require more capital investment for the additional production of cast iron and preparation of scrap. Taking into consideration interrelated investment, the full capital outlays in the second modernization variant will be 18 million rubles higher than in the first.

The basic indicators of the variants are shown in the table.

It can be seen from the table that on the basis of adduced expenditures, preference should be given to the less capital intensive first variant, although production cost and the plant's capital intensiveness of steel is lower in the

second variant. Its realization will make it possible to obtain at the place of investment an additional 3.5 million rubles of the net product per year with lower full production outlays.

In the analyzed variants, it was proposed to increase steel production in the shop without increasing and even reducing the number of workers. At the same time, it is possible with modernization to put into operation a considerable quantity of new capital and to have a certain increase in the number of workers. In such cases, those variants are preferable which envisage concrete measures for the provision of additional manpower for the modernized facility. But in the evaluation of capital expenditures for modernization and the time of utilizing investment, it is important to take into consideration the advantageousness of building additional housing and other facilities of cultural and everyday use.

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INDUSTRIAL DEVELOPMENT AND PERFORMANCE

FURTHER STRENGTHENING OF INTERINDUSTRIAL TIES URGED

Moscow PLANOVYE KHOZYAYSTVO in Russian No 1, Jan 84 pp 56-60

[Article by Dr of Economic Sciences V. Andrianov: "Intensification of Intersectorial Ties as a Prerequisite for Enhancing Production Efficiency." A basis for discussion]

[Text] Upgrading public production efficiency and work quality in all areas of the national economy is the most important direction in the development of the socialist economy. The successful solution of the problem of improving quality is possible as a result of the advancement of national economic proportions and the strengthening of intersectorial ties in the country's national economy. Strengthening ties among industrial sectors which are systematic steps in the production of goods for final consumption or in the utilization of complex raw materials is particularly important in terms of enhancing production efficiency. Improvements in the quality and level of readiness of goods for consumption entail major structural changes in industry and, above all, in the ratio between extracting and processing industries. Ratios within the processing industry itself change as well.

Presently, in connection with the task of intensifying public production and improving work quality, it has become necessary to accelerate the process of structural changes and improvements in intersectorial relations. In our view, this process can be energized by developing and implementing intersectorial programs which call for purposeful progressive changes in existing resource (manpower, financial and material) distribution ratios both between extracting and processing sectors and among sectors in the processing industry. The formulation of such programs requires increased scientific studies in which sectorial developments remain dominant. Such studies involve the termination of priority directions and the sequence in the advancement of intersectorial relations and the definition of conditions under which their interaction yields the highest possible economic results.

The number of intersectorial relations in the national economy and in industry is exceptionally high. Along with resolving problems related to the development of the machine-building, chemical, metallurgical, agroindustrial, fuel-energy and other sectorial complexes, we must also develop the machine-building-metallurgical, petroleum and gas-chemical, chemical-metallurgical, timber chemical and other complexes.

As we know, today the conservation of ferrous metals plays a major role in enhancing public production efficiency. The economy is based on improving the quality and upgrading the level of readiness for consumption of ferrous metallurgy goods and the use of highly efficient metal-processing

technology with fewer stages. The increased utilization of use of synthetic materials and light-weight alloys in the manufacturing of machines and equipment contribute to a certain extent to the conservation of ferrous metals. It may appear that in resolving the problem of metal conservation, the entire range of sectors and production lines should be considered, such as ferrous and nonferrous metallurgy, machine building and the production of plastics. However, nine-tenths of results, both current and in the future, come from improvements in relations between ferrous metallurgy and machine-building. This is based on the fact that ferrous metals retain their role as the main structural material. In order not to lessen the attention paid to the main trend in resolving the problem and to prevent the waste of resources it would be expedient to reduce the range of the intersectorial complex.

The complexes within the national economic sectors and subsectors can be divided into two groups based on the extent of their economic influence on social production effectiveness. The first combines sectors and production lines within which the improvement of ties takes place on the scale of the entire country (machine building and ferrous metallurgy; petroleum, natural gas, petroleum refining and coal industries and the electric power industry; petroleum extraction, petroleum refining and petrochemistry, timber procurement, timber processing and cellulose-paper industry, and so on). The second includes complexes of local significance (extensive and comprehensive treatment of concentrated ores and nonferrous and ferrous metal ores).

The efficiency of intersectorial ties and their influence on material-, labor- and capital-intensiveness of output is the result of the combined efforts of the sectors and their production facilities. For example, the operational efficiency of the machine-building and metallurgical complex is the result not only of broadening the variety and improving the quality of the rolled metals but the application of the latest metal-processing methods such as stamping, rolling, welding and others.

Improving the quality of output and upgrading the degree of readiness for its further consumption naturally trigger profound qualitative changes in its processing (utilization). For example, the use of high-grade metal goods enables us to convert to a more advanced metal-processing technology and to reduce resource outlays (labor, financial and material) per unit of output in machine building. This means that as a result of strengthening intersectorial ties within the national economic complexes, despite a certain increase in the cost of intermediary products, efficiency in the production of finished goods improves.

The complex of intersectorial ties is considered a single entity within which the level of development of the individual units should contribute to a reduction of overall outlays; the nonproportional development of even a single unit may drastically lower expected results. The resources allocated for the development of the sectors and production lines within each complex must be considered as a unit; it would be expedient to handle them with a view to achieving the highest possible results. In other words, it is a question of the possibility and necessity of redistributing manpower and monetary and material resources within the national economic complexes which consist of interrelated industrial sectors.

Studies have indicated that with the present resource ratio among procurement, processing and assembling production facilities the output in machine building output (in percentage of the overall industrial output) is inconsistent with the amounts of manpower and monetary and material resources used. The question arises of changing the ratios (redistributing) of resources used in machine building and ferrous metallurgy. The need for converting to contemporary metal-processing methods has become apparent (extrusion, rolling, welding and others). Most resources in ferrous metallurgy should be used above all to increase electrosteel smelting capacities and to reconstruct and technically retool the production of rolled parts and to increase the capacities of the fourth processing stage.

The task is to change the structure (including the technological) in machine building and to create conditions for the faster growth of output in terms of consumed resources on the basis of supplying the machine-building industry with metal goods of higher strength and a higher level of readiness for processing.

One of the most important tasks in the development of the fuel and energy complex is to ensure the increased share of resources allocated for petroleum refining with a view to increasing the production of lighter petroleum products.

The purposeful strengthening of intersectorial relations within the complexes and the satisfaction of reciprocal quantitative and qualitative requirements in the sectors substantially change our views on priorities in the allocation of resources. We know that here preference is given to third-level sectors which produce finished goods (machine-building and light and food industries). At the same time, steps are considered to minimize the consumption of first (raw material sectors) and second (intermediary production sectors) levels.

Economic intensification and the increased efficiency of public production, based on it, inevitably lead to changes in resource distribution. The need for a high concentration of resources in the processing sectors and their sensible conservation in sectors producing intermediary goods and in the extracting industrial sectors will remain. At the present stage of public production intensification, however, it is necessary to increase somewhat the share of resources allocated for the development of intermediary sectors (ferrous metallurgy, a number of chemical industry subsectors and petroleum refining) while reducing somewhat the share of the third-level sectors.

In a number of cases some resources allocated to the production area should be shifted to consumption in order to upgrade production and consumption efficiency. This is quite important in increasing returns from the use of chemical fertilizers, which are based on the volume of additional agricultural output per unit of applied fertilizer. We know that currently the transportation, warehousing and technical facilities with the help of which chemical fertilizers are applied to the soil have fallen drastically behind their production. As a result, quantitative and, particularly, qualitative losses in chemical fertilizers remain high and crop increases per unit of fertilizer are slow. Chemical fertilizer losses cannot be reduced to a minimum without a proportional development of all units within the complex. In turn, proportionality predetermines the redistribution of resources within

the complex and the transfer of some of them from the production to the consumption sphere. Specific redistribution rates should be formulated for each 5-year period in accordance with the approved scale of reduction of chemical fertilizer losses. Let us point out that in the redistribution of resources a certain drop in the growth rates of the production of chemical fertilizers is admissible providing that it is balanced by loss reductions.

The boundaries of the complexes within the interrelated sectors should be accurately defined and must clearly reflect their share which directly influences the nature of resource redistribution. It would be expedient for the machine-building and metallurgical complex to encompass all machine-building sectors other than those involving a minor share of ferrous metal outlays, such as instrument making. In refining the pace of redistribution of resources within the fuel and energy complex, resulting from intensified petroleum refining, we should single out among all of its sectors geological surveying, extraction, development of petroleum deposits, and petroleum transportation and refining; in transportation we should single out specialized facilities (ore carriers, hoppers, containers) and so on.

In defining the degree of acceleration of the process of redistribution of resources we should take into consideration that the existing ratios in the development of sectors and production lines within the complexes cannot be changed within a short period of time; such changes exceed a single 5-year period; they would go through several stages at each one of which the redistribution of resources would be subject to certain objective restrictions. They are needed because, to begin with, on each occasion we are redistributing a fixed volume of manpower and financial and material resources; secondly, at any stage in their redistribution we must strictly observe the stipulated level of proportionality, which is possible if the concentration of resources in one sector enables us to conserve them in another.

The current sectorial lack of coordination hinders the efficient combination of some of the resources in the individual sectors. Therefore, it is precisely intersectorial programs which must be applied in order to eliminate any lack of coordination among sectors and production facilities which, in the final account, are interested in the comprehensive processing of the raw materials. For example, in order to achieve high results in the comprehensive use of nepheline, obviously it would be expedient to combine (in proportion to the volume of the respective output) the resources of the chemical and nonferrous metallurgical industry and the construction materials industry. The higher level degree of comprehensive use of timber predetermines the need for the rational concentration of resources in subsectors engaged in the extensive processing of lumber--the production of plywood, fiberwood and pressed wood tiles, cardboard and paper.

The comprehensive processing and the efficiency with which the petroleum, petroleum gas and gas condensate are made possible by increasing the share of resources allocated for improving the system used in their extraction, collection, preparation, and particularly treatment; synchronizing the commissioning of oil and gas fields, gas treatment and petrochemical enterprises and pipelines connecting oil and gas fields to enterprises for processing petroleum, gas condensate and natural gas. The lack of synchronization in equipping the oil fields and delays in the creation of gas-collecting

gas-collecting systems, gas-processing plants and facilities for transporting the products of the treated gas to chemical enterprises and other consumers result in major losses of a nonrecoverable raw material.

This proves that today it is no longer sufficient to plan the development of individual industrial sectors on the basis of proven output requirements. In resolving the most important problem of production intensification and quality, we must plan a type of efficiency which could be reached on the intersectorial level. In our view, the draft national economic plan should include an intersectorial section the purpose of which would be to resolve problems arising at the intersection of national economic and industrial sectors.

Improving ratios on the basis of the redistribution of manpower and monetary and material resources requires considerable time, painstaking methodical and practical preparations and thorough economic substantiation. The purposeful and economically substantiated redistribution of resources presumes the need to discard a number of familiar concepts related to sectorial efficiency. An example of this is our concept of the use of capacities in industrial sectors and subsectors. From the sectorial point of view it is considered today as almost indisputable that the more completely existing capacities are used the more efficiently the sector develops. However, frequently increasing the capacity utilization coefficient conflicts with increasing the variety of output and readiness for further consumption, i.e., in the final account it conflicts with the requirements governing the growth of national economic efficiency.

In order to undertake the necessary economic steps for improving intersectorial proportions, the sectors which play a key role in the complex must, as a rule, have reserve capacities. Their availability must be coordinated with the requirements of reaching higher national economic efficiency, for this allows, within certain limits, the governance of available machine fleets and technological equipment in order to satisfy better the quantitative and qualitative requirements of the national economy.

In assessing production efficiency the very important task arises of regulating relations between commodity suppliers and consumers and the objective distribution of economic results between them. Frequently, in practice virtually the entire result of the production of new and better-quality goods goes to the consumer, as a result of which the supplier is insufficiently interested in improving the quality of output and increasing the level of its readiness for consumption; prices do not always sufficiently reflect the consumer value of some very important types of raw materials, recycled ones in particular. In this connection we must increase the stimulating role of prices in order to ensure the fuller utilization of secondary raw materials and byproducts.

Problems related to the intensification of intersectorial relations are exceptionally topical today, when steps to intensify public production are being taken in the country.

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RESOURCE UTILIZATION AND SUPPLY

RESOURCE RESERVES IN NATIONAL ECONOMY DISCUSSED

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[Article by Ye. V. Gregorzhevskaya: "Reserves in the National Economic Balance"]

[Text] The article examines certain aspects in the problem of balancing the economy. As one of the possible approaches to improving resource planning, it has been proposed that the national economic planning and report balances include a new section, a reserves balance. This proposal viewed by the author from theoretical and procedural positions has made it possible to formulate useful conclusions from a practical viewpoint.

The decisions of the 26th CPSU Congress have posed for national economic planning the task of ensuring greater balance in the socialist economy with fewer expenditures of material, labor and financial resources. The most important area in carrying out this task is to improve the balance methods of planning resource stocks in the national economy.

In the national economic balance, in being the basic instrument ensuring the balancing of the plan, the stocks of material, labor and financial resources and the stocks of production capacity are shown as separate indicators in different sections and do not comprise a single intercoordinated system.

In actuality, in the balance of social product and the material balances concretizing it, the indicators for the stocks of the corresponding types of raw products, materials, preassembled articles and so forth for the suppliers and the consumers are given at the beginning and end of the plan or report period. The balance for national wealth shows in an aggregate form the receipt, withdrawal, the presence at the year's end and the increase over the year in the material working capital and stocks. In the balances of fixed capital and capacity, all production capacity is shown at the beginning and end of the year without any division into operating or in reserve. In the adopted scheme of the labor resource balance, the supply of manpower is only partially shown. The indicators for the reserve of financial resources are reflected in the national income balance. The stocks of material and financial resources held by the population are shown in the balances of national income, monetary income and expenditures of the population. Thus, in the presently adopted schemes of both

the planning and report national economic balances, stocks are not fully and adequately shown. As a result, in working out the indicators for the national economy balance which characterize the scale, the rate of expanded reproduction and the basic national economic proportions, it is difficult to accurately correlate the reserve of production capacity with the corresponding stocks of raw products, materials, labor force and financial resources. The balance does not provide an opportunity to establish the degree of "utility" of the various types of stocks for the national economy, that is, to determine which stocks of resources are in a surplus, which are in short supply and without this the system of national economic indicators cannot be fully balanced.

At the same time, the necessity of planning for an integrated system of stocks in production and circulation which would incorporate capacity and finished goods, manpower and machines was pointed out by N. A. Voznesenskiy [2], considering such a system an indication of mature planning and organization of production.

For ensuring the planned balance of a socialist economy with the minimum necessary stock level, it is advisable to incorporate in the national economic balance a new section showing a system of stock balances.

The proposed system would consist of the following: 1) balances of the stocks of state and cooperative enterprises, organizations and associations; 2) balances of stocks held by the ministries and departments; 3) free balances for the economic sectors; 4) a balance of centralized stocks; 5) an aggregate balance of stocks for the national economy; 6) a balance of stocks held by the population.

The given system of balances should, on the one hand, by forming the necessary level of planned stocks ensure the stable and balanced functioning of the national economy, and, on the other, prevent the formation of surplus stocks of some types of resources and a shortage of others.

Diagram of Balance of Stocks

Stocks	Materials	Capacity	Manpower	Financial Resources
Normal stock				
Ensuring current cycle of reproduction				
Circulating				
Reserve				
Ensuring long-range reproduction cycle				
Forced supply				
Surplus				
Anomalous				
Total stocks				
Stock shortage				
Relative				
Absolute				

The basis of the scheme of balances is a classification of stocks by their four features: type, form, purpose and time.

Stocks according to the types of resources included in them are divided into material stocks in the sphere of production and circulation, the stocks or supplies of production capacity, manpower reserves and the stocks of financial resources.¹

Stocks in terms of form are divided into normal stocks which are formed consciously in the aim of ensuring a continual reproduction process and without which, consequently, balanced economic development is impossible in the process of carrying out a plan (the plan is balanced considering these stocks) and the forced stocks or supplies which form spontaneously as shortcomings and mistakes accumulate in planning and management, material-technical supply and trade. For example, the inventories of finished products at the warehouse of a manufacturing enterprise or stocks in trade can be formed by force as a consequence of the fact that they are not in demand. In this instance, as K. Marx wrote, "...the volume of the commodity stock excessively inflated as a consequence of the halting of circulation can mistakenly be seen as a symptom of the expansion of the reproduction process; this mistake becomes particularly possible when with the development of a credit system the actual movement can be mystified" [1].

The actual availability of stocks below a normal level causes a state of a stock shortage. For each definite type of resources in actual production, the forced stocks and the deficit cancel each other out. But in the aggregate balances, these indicators exist pointing to the necessity of redistributing the stocks between the enterprises, sectors and spheres of production.

In terms of the time necessary for ensuring continuous production, the normal stock can be divided into that ensuring the current reproduction cycle, that is, the stock of resources which at any moment of time can be utilized in production consumption and that ensuring the long-term reproduction cycle or the stock earmarked for use in subsequent planning periods.

The formation and the amounts of the stocks depend upon their purpose. A normal stock in terms of purpose can be divided into circulating and reserve.

A circulating stock is created consciously in the aim of ensuring the continuity of the reproduction process under the conditions of the adopted production methods and structure of production ties. The continuity of the process, K. Marx wrote [1], requires that the presence of the conditions necessary for it depends neither on interruptions in purchasing the necessary raw products and materials nor upon whether the produced product is sold daily or weekly, that is, the seasonal nature of production and consumption. Thus, the amount of the circulating stock is influenced by a number of factors: the seasonality of production and consumption, the production methods, the organization of production, as well as the forms of supply, marketing and payment.

¹ The reserves of natural resources are not examined here since they are not the result of social production.

The reserve stock is consciously created in the event of unforeseen events and circumstances in the aim of preventing or eliminating the losses caused by them. The reserve stock should ensure the continuity of reproduction with the occurrence of any eventualities as well as natural disasters and other extraordinary events. K. Marx wrote: "In order that the production process occurs continuously--completely independently of whether or not this stock is replenished daily or at certain dates--it is essential that the place of production constantly have available a larger stock of raw products and so forth than is required, for example, daily or weekly...the less the reliability, regularity and speed of delivery, the more significant the producer's latent portion of productive capital should be, that is,...the stock of raw materials and so forth" [1, p 161]. Analogously the amounts of the commodity stock should be greater than the average amounts of sales or the average amounts of demand so that an excess above the average amount of demand can be satisfied. The reserve stock, in contrast to the circulating one, is put into the reproduction process only in those instances for which its establishing was planned.

For determining the size of the reserve stock, a solution to the "ambiguity" problem is of great importance. Usually two aspects of this are examined. The first involves random changes in demand in the processes of production, sales and consumption. The second aspect is linked to the unpredictability of future major changes in scientific-technical progress and in the socioeconomic goals of society as a whole. As for the first aspect, unforeseen, random events arise chiefly in the lower levels of the economic hierarchy. On a higher level of the economic hierarchy such events are rather determined. In actuality, if the total debt of an individual purchaser to an individual supplier is a random amount and thus unpredictable and undetermined, the total debts of all purchasers to an individual supplier can be determined as a probability amount while the total amount of debts in the national economy with the established payment system is a rather permanent amount which can be assessed. Thus, in planning and forecasting the reserve stock for the national economy as a whole, it is possible to disregard the indeterminability on the lower levels of the economic hierarchy. As for the second aspect, it can also be generated on a higher level. However the problem, in our view, is solvable on the basis of the approach proposed by N. Ya. Petrakov [3]. Here we will merely repeat him: indisputable is the obvious fact that in aggregating information on the higher levels of the hierarchy, the information by averaging an unique depersonalization becomes inert and stable. The loss of information in the aggregating is the price of overcoming the indeterminability. This loss in principle is irretrievable but it does at least allow the slight moving forward of the "time machine." N. Ya. Petrakov has concluded that any estimate of the future can be considered scientific only in the instance that it is given in a generalized form, with a high level of information aggregating, like a "bird's eye view." Such a theoretical approach can also be employed in forecasting the reserve stock.

The forced reserve is divided into surplus and anomalous. The surplus stock can be employed for its given purpose at the same installation in the future or at other installations. The anomalous stock cannot be employed due to the absence of demand for the resources comprising it.

In the balances a relative scarcity corresponds to the surplus stock of resources and this can be eliminated by redistributing the stock while the absolute scarcity of resources corresponds to the anomalous stock and this cannot be eliminated by reallocation.

The formation of the forced stock not only leads to an imbalance in the national economy but also reduces the effectiveness of social production by the amount of expenditures on its upkeep and redistribution.

Let us examine the general scheme of the balance of stocks (see the diagram) in terms of the state and cooperative enterprises, organizations and associations.

The material stocks in the production and circulation sphere are the aggregate of material resources temporarily not participating in the reproduction process. These include: stocks of raw products, materials, equipment, fuel, crating and packaging, incomplete production, finished products, commodities, seed, fodder and so forth.

Among the circulating stock of materials at enterprises is the prepared stock of raw products, materials and so forth needed to carry out the operations involved in unloading, receiving and preparatory operations; the current stock ensuring continuous supply of production with a definite size, grade and type of material, the rhythmical delivery of equipment for installation at construction organizations, the constant supply of commodities in the required amount and assortment in the trade organizations during the period between two deliveries; a seasonal stock or stocks of raw products, materials, fuel and so forth related to the seasonal nature of their production or delivery and determined, for instance, by the navigation season. In agriculture and trade, the seasonal stocks are related not only to the production of the product for which they are formed (feed in agriculture) but also the seasonality of consumption. Seasonal stocks are also created for ensuring the uninterrupted operation of enterprises during the winter season.

The reserve stock of materials consists of the emergency supplies of raw products, materials and so forth needed to ensure continuous production in the event of a delay in delivery; emergency supplies of units of equipment in the event of emergencies and planned overhaul; emergency supplies of seed, fodder and so forth in the event of crop failures (on the kolkhozes and sovkhozes).

The normal supply of materials ensuring the long-term reproduction cycle is the construction stock necessary for completing the fixed capital and production capacity on the planned date.

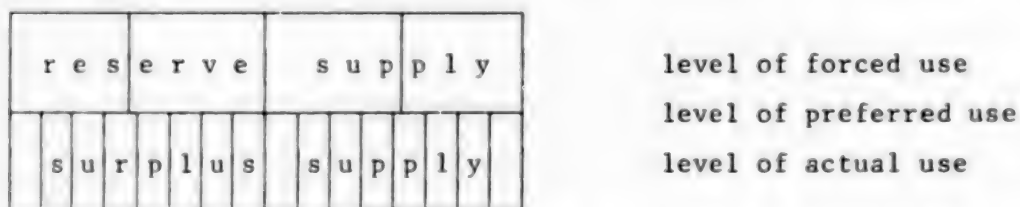
Surplus stocks of materials include above-norm stocks not credited by the bank as well as material stocks which are not employed at the given enterprise but can be used at another one.

At enterprises the anomalous material stock is the stocks of narrowly specialized raw products, materials, incomplete production (construction) and so forth which have become unnecessary as a result of the change in the production specialization of the enterprise and for this reason cannot be sold, or stocks

which cost too much to move. Also considered as anomalous stocks are the inventories of commodities and finished products which are not in demand.

Generally speaking, in practice a normal stock often contains surplus resources due to overstating the demand for them. This is related, in the first place, to the still unresolved problem of norming production needs and planning in material-technical supply from the achieved level and, secondly, to the disinterest of the enterprises in disclosing them. At present, the planned expenditures for maintaining the stocks are not fully reflected in the enterprises' cost accounting interests. This is related to the expenditure principle employed in price formation. The expenditures of the product producers comprise the basis of price formation. The higher the expenditures, the higher the prices. If the product is sold at prices below the planned outlays (including the outlays for maintaining stocks), then such a planned-loss enterprise receives subsidies from the state budget. Thus, all the planned expenditures of the enterprises on maintaining the stocks are covered either by the purchaser or by the state. As a result, the enterprise has not enough incentive to reduce the planned level of stocks. But the enterprises also keep above-plan stocks and here even an increase in the payment for capital and interest on bank credit and the introduction of a payment for labor resources do not force the consumer to reduce the amount under conditions of: a) insufficient reliability of material and technical supply; b) planning emergency supplies of raw products and materials only in the event of transit nondeliveries; c) the systematic involvement of the labor force in jobs not related to the enterprise's basic production activity.

The next type of stocks formed at an enterprise is the stock or reserve of production capacity which consists of a reserve of capacity for producing products, warehouse and production space, the handling capacity of railroads and motor roads, communications channels and so forth. The distribution of the capacity supply into reserve and surplus for visibility can be shown in the form of a diagram:



The entire supply of production capacity is determined as the difference between the capacity with its forced and actual use and the reserve supply as the difference between capacity with its forced and preferential use.

A reserve supply of production capacity is essential, in the first place, for eliminating the seasonal, intraweek and intraday loads in electric power, in sectors producing rapidly spoiling products and so forth, and secondly, in the event of unplanned situations for restoring the warehouse supplies of products during the year (at enterprises a reserve capacity supply can be formed by reducing the use factor of obsolete equipment and also, basically at new enterprises, by capacity employed for testing out new production decisions).²

² The formation of a reserve capacity supply has been examined in detail in [4].

In selecting the preferred level of utilizing production capacity it is essential to consider that as the load factor increases one must draw on less productive equipment and as a result the additional product costs more. The reserve capacity supply, on the one hand, should be sufficient for maintaining the planned economic growth rates and, on the other, correlated to the corresponding types of resources. Hence the planned growth rates should be oriented to the amount of the reserve capacity supply.

The normal supply of production capacity which ensures the long-term reproduction cycle includes capacity undergoing reconstruction and resetting for producing a new product; equipment at a warehouse and destined to be employed in basic production in a future period.

The surplus supply of production capacity is determined as the difference between the preferential and actual use. This is formed as a result of the shortage of the corresponding resources (manpower, materials or money) needed for maintaining the preferential use level.

In the anomalous supply of production capacity is the equipment installed at the enterprise which cannot be properly used in the forthcoming period and cannot be sold due to the lack of demand as well as obsolete equipment to be written off.

The next type of stock for supply is the manpower supply without which a continuous process of social reproduction cannot be ensured.

The manpower supply can be determined as the difference between the number of able-bodied persons employed in social production and in education and the amount of the manpower demand calculated on the basis of the nominal working time fund.

In calculating the manpower supply, one takes into account the working time losses due to education (away from the job), regular and additional leaves and vacations, absences due to the birth of children, sickness, the performing of state and social duties, the reduced length of the working day for juveniles, nursing mothers, on preholiday days and so forth.

At an enterprise a rotating manpower supply is essential for ensuring a continuous current production process due to working time losses caused by regular leaves.³

The reserve manpower supply of the enterprises is formed in the event of working time losses caused by additional and educational leaves, absences due to the birth of children, sickness, the performing of state and social duties, absences without leave and so forth⁴ in the aim of supplying the current capacity.

³ V. Kuz'mishchev proposes planning the manpower supply for sponsorship work in the countryside (see [5]).

⁴ In our view, the reserve manpower supply at enterprises should also be viewed considering the working time losses caused by the dismissal of employees at their own request during the year and for violations of labor discipline. In addition, the amount of the supply should compensate for the maximum working time losses during the days of the planning period.

The normal manpower supply which ensures the long-term reproduction cycle includes the preparatory supply (students on the job; the students in vocational-technical schools and specialized secondary institutions of learning which are operated on the enterprise balance sheet, formed for providing production with manpower of the corresponding skill to replace those leaving (considering the future directions of scientific and technical progress); a structural reserve or supply (students in advanced training and retraining courses off the job organized under the enterprise) needed for the internal redistribution of manpower caused by scientific and technical progress.

A surplus manpower supply is determined by the difference between the actual number of employees and the planned demand for them.

Among the basic reasons for the formation of surplus manpower at enterprises one must also put the systematic involvement of employees in jobs not related to the basic production activity (agricultural work, construction, municipal services and so forth). As a result, as a survey of 40 industrial enterprises showed, the number of absences permitted by law is double the amount considered in working out the working time balance [6].

The next type of stock or reserve is the reserve of financial resources which includes money which has ceased moving in the economic circulation of its possessors, that is: cash and money on account.

The formation of a monetary reserve does not mean the excluding of money from circulation analogous to the formation of a stock of materials due to their "withdrawal" from social production. The money reserve always remains in the circulation channels regardless of in what form the money is kept: as cash or noncash, as either is a source of bank credit resources.

Under the conditions of the existence of commodity-monetary relationships, the enterprises need money to acquire stocks of materials and maintain supplies of production capacity and manpower. Thus, the reserve of financial resources is essential for ensuring the solvency of its owner.

The circulating reserve of financial resources is the monetary portion of enterprise working capital in the form of cash, money on payment and current accounts and in payments.

The reserve supply of financial resources is formed as a money reserve guaranteeing the payment of leaves (in industry) and labor payment (on the kolkhozes and sovkhozes).

Presently, the enterprises do not form a reserve holding of financial resources for that eventuality when payments with a supplier must be made while money has not been received from the purchaser for a dispatched finished product. The function of the reserve supply in practice is automatically carried out bank credits. Such a procedure limits the material liability of the enterprises for the results of economic activities.

A normal supply of financial resources ensuring an enterprise's long-term reproduction cycle includes the balances of the money in the amortization fund

earmarked for the technical reequipping and reconstruction and major overhauls; the money in the production development fund earmarked for carrying out measures related to mechanization, automation, improving the organization of production and labor and so forth; the material incentive fund and the other economic incentive funds.

Among the surplus supply of financial resources are balances of money which have not been employed during the report period due to a lack of material resources, manpower or production capacity earmarked for covering them. A surplus supply of financial resources in a subsequent period is included in the enterprise's solvent demand thereby characterizing the amount of the shortage of corresponding resources.

Let us briefly examine the stock balance of the ministries and departments. The scheme for the balance is analogous to the previous one, with the exception of the fact that the normal stock coincides with the reserve and a production capacity supply is not formed.

The reserve materials stocks includes the emergency material stock necessary for the event of unplanned situations (changes in the plans, the overfulfillment or nonfulfillment of the plans by the sector's enterprises) and emergency stocks in the event of a bad harvest (in the Ministry of Agriculture).

The surplus and anomalous materials stocks are determined analogously to the corresponding stocks of the enterprises.

The normal manpower supply which ensures the long-term reproduction cycle includes the students in the sectorial advanced training and retraining courses. Simultaneously it would be advisable to form a reserve manpower supply by increasing the number of students above the sector's long-range needs for the corresponding specialists for ensuring the putting into operation of the enterprise reserve capacity supply.

The reserve stock of financial resources formed in the ministries and departments is essential for ensuring the solvency of the sector's enterprises in those instances when the adjusting of the enterprise's financial situation from other sources (for example, bank credits) is excluded. The reserve supply of financial resources includes: a fund for financial assistance to the enterprises, a reserve major overhaul fund, a reserve capital investment fund (from allocations for capital investments in percent of the estimated cost of construction) and so forth.

The normal supply of financial resources ensuring the long-term reproduction cycle includes the balances of money in the unified scientific and technical development fund; the amortization fund (the centralized part of amortization deductions) earmarked for the reconstruction and technical reequipping of operating enterprises.

The aggregate balances of the economic sectors comprise an important place in the system of stock balances. In the first place, these provide for the equality of the actual amounts of stocks in terms of resource types to the necessary amounts of the normal stock or reserve. This equality in the balance is

achieved as a result of eliminating the shortage of individual types of resources by redistributing the surplus stocks. The designated equality occurs if the amount of the absolute scarcity equals zero. Otherwise, the balances of the forced stock and the absolute shortage are indicated in the summary national economic balance. Secondly, the aggregate sectorial balance provides a congruity in the amount of the reserve capacity supply for all the sector's enterprises and the amount of the reserve manpower supply of the corresponding ministry (department).

The balance for centralized stocks is of particularly important significance. These stocks provide the economic conditions for realizing the centralized managing effects on the developing economic and business situation.

The reserve materials stock--the state material reserves and reserves of the USSR Council of Ministers--is essential for eliminating the disproportions which arise in carrying out the plan.

The reserve capacity supply is essential for solving the problems of statewide importance (maintaining national defense capability and so forth).

The normal manpower supply which ensures the long-range reproduction cycle includes: the preparatory reserve or supply in the form of students in vocational-technical schools, specialized secondary schools and institutions of higher learning, students of the 9th-10th grades in general education schools, and persons studying off the job (with the exception of students in those institutions of learning which are operated by the enterprises) and essential for providing social production with the manpower to replace that leaving; the structural supply or reserve in the form of students in the state advanced training and retraining courses as necessary for ensuring intersectorial redistribution of the labor force.

The normal supply of financial resources which ensures the current reproduction cycle is formed in the form of a circulating stock or supply which includes the balances of money on account for the current use of the USSR State Budget and a reserve supply which includes: the reserve funds for eliminating disproportions arising in the course of carrying out the plan; for this the reserve funds of the USSR Council of Ministers and the Union republic councils of ministers in the state budget and the funds for unforeseen expenditures in the budgets of the autonomous republics and local budgets are partially employed; the reserve funds for the regular carrying out of the budget including the funds for planned circulating cash in all the elements of the budget system (from the Union budget to the budget of the rural and municipal soviets). For covering temporary gaps between income and expenditures, the special budget reserves in the inferior units needed to ensure the paying of teachers and medical workers; other budget reserves in the Union budget (the price regulation reserve and others); the reserve funds for strengthening the credit resources of the State Bank (these are drawn chiefly from the money formed from the excess of income over expenditures in the State Budget). In the bank credit plan a reserve supply is created which is the nondistributed portion of the loan fund. This portion acts as a reserve of the bank boards. For covering the possible bank losses, provision is made for reserve funds which are formed annually from the deductions of the bank net profit until these reach the amount of the

charter capital; emergency funds for covering losses from natural disasters and accidents; for this purpose they utilize a portion of the reserve funds of the USSR Council of Ministers, the Union republic councils of ministers in the State Budget and the reserve funds of state property insurance; gold and foreign exchange reserves of the state. The reserves of gold and foreign exchange in being widely employed and freely convertible are an important factor in the nation's internal economic development. From these holdings in the necessary instances it is possible to replenish commodity resources and this makes it possible to quickly eliminate disproportions in national economic development and to balance production and consumption of one or another type of product drawing on the foreign markets.

The balance of money from the excess of State Budget income over expenditures is among the normal supply ensuring the long-range reproduction cycle.

All the above-described stocks and supplies are generalized in the aggregate national economic stock balance. The indicators of the stocks for all types of resources are determined as the total of indicators in the balance of centralized stocks and aggregate balances of the economic sectors. As a result the amount of the forced stock for the national economy as a whole describes the level of its balancing.

For planning the standard of living, the volume of consumer goods, the volume of retail commodity turnover and so forth as well as for ensuring the material and financial balancing, data on the stocks held by the population are very essential. In contrast to the given scheme, the balance of stocks held by the population is compiled only for the stocks of materials and financial resources. The balance of stocks held by the population can be compiled on a differentiated basis in terms of income groups, regions and so forth as well as in a summary form.

The circulating stock of materials in this balance includes the stocks of articles in short-term (current) consumption and consumer durables in the personal property of the population.

The forced stock held by the population is formed as a consequence of the imbalance in the market of consumer goods. A shortage of a number of consumer goods gives rise to a surplus demand for them and leads to the formation of surplus stocks.

Among the surplus materials stock held by the population one can put the following: the stocks of current consumption articles exceeding the rational consumption standards (considering the income level) as well as those which cannot be employed in a given family (group and so forth); the stocks of unutilized consumer durables.

The anomalous stock is the stock of consumer goods which cannot be employed due to going out of fashion, spoilage and so forth.

The next type of stocks held by the population is the stock or supply of financial resources.

The circulating supply of financial resources includes the balance of money serving current consumption of materials and services.

The reserve supply of financial resources is represented by the money (on deposit or in cash) set aside for unforeseen expenditures related to sickness, accident and so forth.

The normal supply of financial resources which ensures the long-range reproduction cycle includes the money of the public deposited to purchase consumer durables.

In the surplus supply of financial resources are the savings of the public formed from income which has not gained a material equivalent in the planning period. Like the surplus supplies of financial resources of the enterprises, ministries and departments, these are included in the solvent demand of the subsequent period.

The given system of stock balances, in being essential to ensure greater balance in the national economy, will also make it possible on the basis of the established ratios of the given types of stocks to forecast their volume and proportions over the long run for each subsequent level of economic development.

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10272

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RESOURCE UTILIZATION AND SUPPLY

LAX APPROACH TO MATERIAL CONSERVATION DECRIED

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 12, Dec 83 pp 19-26

[Article by S. Anisimov: "Production Planning and the Reduction of Material Consumption"]

[Text] The carrying out of the task posed by the 26th CPSU Congress of further increasing the efficiency of social production by intensifying the economy under present-day conditions as never before requires a considerate attitude to all valuable materials, the observing of thriftiness and the rational utilization of all material resources. "At present, economy and a thrifty attitude toward the goods of the people is a question in the feasibility of our plans. Its solution must be ensured by an entire system of practical measures, primarily from the USSR Gosplan and the USSR Gosnab, the ministries and departments. Great work must be carried out by all the party committees and organizations," said Comrade Yu. V. Andropov at the November (1982) Plenum of the CPSU Central Committee. Under the conditions of intensifying the economy, the need arises of a more rapid rise in the output of end product in comparison with the expenditures on it. It is essential in every possible way to reduce the material and energy intensiveness of the product and achieve a situation whereby concern for the saving of resources should be a matter for each Soviet worker.

In recent years, the nation has done a good deal to improve the utilization of material resources. A number of decrees of the CPSU Central Committee and the USSR Council of Ministers have been promulgated and these outline specific measures to strengthen thriftiness. Tasks have been set for the economic departments, industrial ministries, enterprises and organizations. Extensive activities have been initiated by the party, soviet and economic organizations in carrying out the party and government decisions.

In implementing the set tasks, the USSR Gosplan has increased the role of the plans on the questions of saving raw products, materials and fuel. The work of the material and technical supply bodies has been noticeably intensified in exercising control over their use. A positive role has been played by the Interdepartmental Commission on Savings and the Rational Utilization of Resources. Many collectives have been initiators in a competition for thriftiness and are increasing the production output without an additional increase in the consumption of raw materials.

Regardless of the fact that significant organizational work has been done and practical measures have been undertaken to strengthen thriftiness, many reserves still remain unutilized. The achievements of scientific and technical progress in the form of resource-saving equipment and production methods are being introduced slowly. Capital investments and material resources continue to be wasted, and there still are shortcomings in planning and material-technical supply and instances of mismanagement and waste; secondary resources have not been sufficiently returned to circulation.

At present, it is important to initiate work in all areas and achieve maximum utilization of the existing reserves everywhere. However, we must particularly take up the questions of improving planning practices.

One of the most important conditions for achieving tangible results in reducing material expenditures on product output is to carry out a policy of rapid technical reequipping of the enterprises. The decisions of the 26th Party Congress point to the need of the primary allocation of capital investments for these purposes. "To channel capital investments primarily into the reconstruction and technical reequipping of enterprises and into the completion of previously commenced projects. The building of new enterprises and the expansion of operating ones should be initiated in the instance that the demand of the national economy for the given type of product cannot be met by increasing the use of production capacity considering its reconstruction and technical reequipping"--stated the congress.

Regardless of the directness of the set task, a major change in this area has not come about. As before, two-thirds of the capital investments are going into expanding production and new capital construction. Considering expenditures on equipment not included in the cost of the construction projects, the proportional amount of the investments reaches 75 percent. With such a reproduction structure of the capital investments, modernization of production capacity is carried out at an extremely slow pace. The aging of operating equipment is occurring along with its physical wear and obsolescence.

All these shortcomings have been very starkly apparent in the development of such an important sector as ferrous metallurgy. Here, as in many other sectors, in allocating the assigned capital investments, more than two-thirds have gone constantly into increasing production by building new shops and units. Clearly insufficient attention has been given to technical reequipping and reconstruction. as a result, regardless of the completion of new capacity, an increase in the production volume of ferrous metals has been occurring slowly.

As is known, reconstruction always involves the shutting down of equipment for the period required to modernize it. And this leads to a drop in the production volume, to a decline in the already insufficient resources of rolled metals and to difficulty in achieving balance. Although such a phenomenon is temporary and after it there will be an increase in product output, the desire not to lose the achieved results even for a time leads to a situation where the reconstruction periods are shifted from year to year while the capital investments go to erect buildings and installations for new shops. At the same time, the equipment in use continues to age. At present, the service life of many blast furnace, electric steel casting and open hearth furnaces as well as rolling mills exceeds the established standards.

Preventive maintenance and major overhauls for the units are carried out regularly. It is becoming more and more difficult to increase the production volume from them. Each year, equipment stoppages increase while the efficiency of its work declines. Last year, for example, the blast furnaces stood idle twice as much as in 1975. The stoppages at rolling mills have also risen. Quotas are not being fulfilled systematically for the output of steel per m² of bottom area of the open hearth furnaces or for increasing the planned use factor of the effective volume of the blast furnaces.

The technical reequipping of many national economic sectors in a number of instances lags behind due to the insufficient attention paid to new resource-saving equipment. There have been frequent instances when obsolete products are produced. For example, in machine building around 30 percent of all the articles have been manufactured for more than 10 years. At the same time, the proportional amount of first developed ones is insignificantly slight.

In reconstructing enterprises, proper attention has not been given to the development of low-waste methods. Certain sectorial institutes in working out the plans for reconstruction do not always incorporate measures aimed at a maximum reduction in the expenditures of raw products, material and fuel. A check of the plans made by the USSR Gosstroy has shown that around 70 percent of them do not contain such measures. Thus, in the plans of Giprovtoagregat [State Design Institute for Automotive Parts] for expanding the Kirghizavtomash [Kirghiz Automotive Equipment] Plant did not provide for better utilization of scrap metal. As a result, a significant amount was written off as scrap while a portion of the metal shavings was thrown out on the dump with the rubbish.

As is known, production development is accompanied by an increase in the consumption of material resources, a portion of which goes into waste. Their amount year after year has been growing and the efficiency of social production depends upon how completely these are utilized. The economic effect from putting secondary raw materials into economic circulation is obtained as a result of reducing the consumption of primary raw products, materials, fuel and electric power and from reducing the expenditures on purchasing these. Moreover, the use of secondary raw materials is one of the most effective ways of conserving nature. The pollution of the territory is reduced and the forests and mineral wealth are saved.

The scrap paper collected in the Tenth Five-Year Plan, for example, made it possible not to fell 600,000 hectares of forest. Moreover, in producing paper and cardboard from the scrap, pollution of the atmosphere is reduced by 86 percent, water pollution by 25-44, while the amount of solid waste is reduced by almost 40 percent.

In recent years, much has been done to put secondary resources into economic use. The plan for USSR economic and social development has a special section on "The Use of Secondary Raw Materials." The ministries and departments have been given quotas for their procurement and processing. Measures are being taken to increase production capacity. New factories have put into operation in Kiev and Leningrad, and these each will produce 200,000 tons of cardboard annually. Here the raw materials include 80 percent waste paper. Construction

of another five mills is underway for producing paper and cardboard employing scrap paper as a raw material.

Regardless of the fact that the questions of utilizing secondary raw materials have begun to attract more attention, reserves in this important area still remain significant. Suffice it to say that scrap paper comprises 23-25 percent in the raw materials for producing paper and cardboard. The use level of worn out tires does not exceed 90 percent of the existing resources, while the figure for steel casting slags is 28 percent, and just 7 percent for phosphogypsum.

The situation which has arisen can be rectified only in the instance that the approach to this problem is fundamentally changed. At present there are clearly insufficient funds which are allocated for establishing capacity to prepare production wastes for reutilization and for building production installations using new production processes, where secondary resources can be employed as raw material sources. In a majority of instances, the proportional amount of capital investments allocated for these purposes is 1 or 2 percent of the total amounts received by the ministries.

As an example, take the ferrous metal scrap. This must be specially prepared if it is to be used in steel casting production. The chips must be compacted together and the large size scrap metal cut into the required size. However, there is constantly not enough capacity for this. The quotas for increasing this are not fulfilled. The proportional amount of capital investments allocated by the USSR Minchermet [Ministry of Ferrous Metallurgy] for creating capacity to process secondary raw materials is just 0.2 percent of the existing funding. At the same time, at the Lipetsk Svobodnyy Sokol Plant alone, around 80,000 tons of scrap metal have been rusting under the open sky for a long time. Basically these are old multiton ingot molds and large equipment beds. Their reprocessing is difficult due to the obsolete pile-driving system which is not capable of cutting up the large parts.

Supplying the national economy with effective types of materials is of great importance for producing product material intensiveness. Their use ensures the maximum satisfying of the consumer properties of the articles, it makes it possible to utilize the raw materials more rationally, it provides a great economic effect and helps to increase the efficiency of social production. Considering the importance of this, the 26th CPSU Congress set the task of accelerating the development of producing efficient types of metal, lumber and other major types of resources. Specific quotas for their growth have been set.

Among the employed structural materials, rolled ferrous metals, steel pipe and hardware hold a special place. These comprise the material basis for virtually all types of implements of labor, regardless of the increased consumption of chemical products and other substitutes. At present, depending upon the available resources of rolled ferrous metals, the output volumes of machine product and capital construction are planned and the intersectorial and intrasectorial proportions are set.

With the present level of machine building and the enormous scale of construction, we must have not merely an increase in the production volumes of rolled metals and pipe but also the output of those types which ensure a reduced weight of the structural elements and machines, increase their durability and provide

an opportunity for the various articles to be operated both under low and high temperatures. For precisely this reason for the 11th Five-Year Plan, a fundamental improvement in the quality and increased output of the efficient types of metal products were designated as the main area for the development of ferrous metallurgy. The task has been set by the end of the five-year plan to increase by 1.5-2-fold the production of cold rolled sheet, rolled products with strengthening heat treating and from low-alloyed steels, plate and sheet with protective coverings, shaped and high-strength rolled sections as well as various types of economic and special pipe.

However, the set quotas have not been satisfactorily fulfilled. Over the 2 years of the 11th Five-Year Plan, the amount of unobtained savings from the more rapid increase in efficient types of metal was 1.5 million tons.

One of the reasons for the lag in fulfilling the quotas for the output of economic types of materials has been the imperfection of the indicators for planning the production volume of various product types. Correctly chosen indicators help to increase precisely that assortment which the national economy needs most.

In the press much has been written about the great effect of calculating the output of paper and polyethylene film in m^2 . The switching from tonnage to the new indicator helps to reduce the thickness of the film and paper. This makes it possible to not only save a large amount of raw material but also to satisfy the needs for a larger number of consumers of these products.

There is an analogous situation in the production of resource-saving equipment. Here also the indicators play an important role. For precisely this reason, in working out the state plans for 1982 and 1983, new product measurements were introduced in machine building for 17 plan items and for 90 items there are second indicators which encourage the producers to improve the economicness of the machines. The new measurements help to produce machine building products with a larger unit capacity with a proportional reduction in its material intensiveness.

The question of improving the indicators is also very pertinent for ferrous metallurgy. The indicator of "physical tons" which has been in effect for many years has helped to increase the production volumes of rolled products and pipe. However, this has often come about by increasing the output of metal-intensive shapes. The desire no matter what the cost to fulfill the plan in tons has told negatively upon developing the output of efficient types of metal products.

This is explained by the fact that the effective types of rolled products, in being less metal intensive but more labor intensive, have reduced the productivity of the mills as calculated by the number of produced tons per unit of time and, consequently, have worsened the economic indicators of the metallurgical enterprises. At the same time the reduced metal intensiveness of the metallurgical products has made it possible to increase their output in meters, pieces and thereby satisfy the demand of a larger number of consumers. A definite contradiction has arisen. This could be eliminated only by improving the planning and evaluation indicators.

As is known, in ferrous metallurgy an experiment is being carried out. At a number of enterprises producing rolled products and pipe, instead of "physical" tons they have introduced an indicator of "conditional" or "equivalent" tons. In the current year, the number of enterprises increased. In 1984, assessing the operations of virtually all metallurgical enterprises will be done depending upon the fulfillment of the set quotas in "equivalent" tons.

The newly introduced indicator, as has already been pointed out, differs from the former in the fact that it considers the labor intensiveness of producing various types of rolled products and pipe. This has been achieved by employing an elaborated system of labor intensiveness coefficients based upon the hot-hour productivity of the metallurgical units in producing the specific types of metal shapes and sizes. Virtually the same conditions have been created for producing any section of rolled product, including the efficient types. Demand is satisfied by improving the structure of rolled products without an increase in the physical tons. This, in turn, provides a savings in ore, coke, refractories and other materials used in production.

An analysis of operations at enterprises where the experiment is being conducted shows that a majority of them have actually increased the output of the labor-intensive assortment. If the production results of the first half of this year are compared with what was achieved in the same period of last year, then the first seven enterprises which converted to the new indicator have produced 271,000 tons more of labor intensive product, having reduced the overall production volume by 299,000 tons. Here individual enterprises have achieved obvious successes. The Krivoy Rog Metallurgical Plant, having reduced the production volume by 19,000 tons, at the same time increased the output of the labor-intensive assortment by 121,000 tons. The Novolipetsk Metallurgical Combine reduced production by 54,000 tons and increased the amount of efficient metal types by 69,000 tons.

Regardless of the fact that the new indicator has had a positive impact on reducing the production of metal-intensive products, it still cannot be said that the efficiency of all social production has been increased as a result of this. This is due to the fact that the existing shortcomings in introducing it have led to the disrupting of balance in the national economy.

At present, two indicators exist in parallel in planning: the "physical" and "equivalent" tons. The "equivalent" tons are employed in setting quotas for the production volumes of the metallurgical enterprises and in evaluating their activities. The production volume for the USSR Minchermet as a whole is planned in "physical" tons. The resource balances and distribution plans are compiled in them as is the schedule ordering of the product. Here the "physical" and "equivalent" tons are not coordinated. When in setting the production load, the established demand for the national economy is converted into "equivalent" tons, a discrepancy with the "physical" tons results running into a million tons.

The presence of the two measurements has sharply complicated the work of drawing up product deliveries. The supply and marketing bodies which issue the orders for delivery must see to it that the metallurgical plants are not overloaded in comparison with the plan in "equivalent" tons and at the same time they must assign all consumers to suppliers in "physical" tons. In practice, it turns out

that either production capacity is overloaded or there are consumers which are not assigned to suppliers. This means that many of them do not receive metal according to the stocks allocated to them and as a consequence their own production is not supplied with raw materials, thereby having a negative effect on the balancing of the plans.

In considering the positive role which the "equivalent" tons play in metallurgical production as well as the fact that this experiment next year will be broadened, in working out the plans it is essential first of all to coordinate as much as possible the volume of production being set in "equivalent" and "physical" tons. Conversion factors are needed for this. Those labor intensiveness coefficients which are in use today are not suitable for this. They are strictly individual for each unit. The same amount of rolled metal has a different coefficient depending upon the type of mill and the existing production methods. Averaged coefficients are required.

The supply and marketing bodies must improve the work in the area of studying the assortment demand of the national economy. At present, in working out the plan, the USSR Gosplan and the USSR Minchermet are given only around 40 percent. Actually, this demand is just for the scarce types and sizes and is, unconditionally, insufficient for correctly calculating the plan in "equivalent" tons. All demand is also necessary in order to bring the "physical" and "equivalent" tons into agreement, that is the production plan with the distribution plan.

The effectiveness of introducing the new indicator will depend upon to what degree the wholesale prices for rolled metals can be brought into agreement with the labor intensiveness of their production. With the currently existing prices, in a number of instances, it is economically more advantageous for the ferrous metallurgy enterprises to produce a metal-intensive rolled product.

In strengthening thriftiness, an important role is played by norming the consumption of all types of material and energy resources. The mobilizing effect of the norms in the rational and economic consumption of resources depends upon to what degree the current consumption standards are technically sound, progressive and correspond to the present level of equipment, technology and the organization of production. The consumption standards are the basis for determining demand and their quality determines the accuracy of the material balances being worked out as well as the correctness of allocating the raw products, materials and fuel.

The USSR Gosplan and the USSR Gosplan, together with the ministries and departments, are doing significant work to improve the setting of standards. The range of resources for which quotas are centrally set for an average decline in the consumption rate has been widened from 43 items in 1980 to 57 items at present. The number of allocation holders for which consumption standards are centrally calculated and quotas are set for the savings of material resources has been increased by 30 percent. During the Tenth Five-Year Plan, some 304,000 standards were revised for the product range of the USSR Gosplan. Due to their reduction, the calculated effectiveness in the national economy was more than 200 million rubles. During the current five-year plan, 560,000 standards have already been revised with an expected effect of over 400 million rubles.

As a result of improving the design decisions and the measures carried out to reduce the material intensiveness of the produced products as well as improving the production processes, during the years of the Tenth Five-Year Plan, around 5 million tons of rolled ferrous metals were saved in machine building. Another 1.5 million tons were saved by replacing the metal with structural plastics, products from cermets and other materials.

Regardless of the stronger control by the central planning bodies over the state of norming the consumption of material resources, proper order has still not been instilled in this area. At many enterprises the work in the norming area is still on an extremely low level. The data of inspections conducted by the bodies of the USSR Gosstab show that approved consumption rates are found at far from all the enterprises. In a number of instances the norming work is done formally while the existing standards do not encourage a reduction in material expenditures.

The ministries and departments exercise little control over the work being done by the departmental enterprises in norm setting and they often improve increased standards. Recently, the practice of their arbitrary increase has become widespread and has harmed the planned management of the national economy. This has led to an artificial increase in demand, it creates tautness in the balances and at the same time has made it possible for certain managers to obtain surplus material resources.

The consumption rates are overstated not only by production enterprises but also by the ministries. The standards submitted to the USSR Gosplan often do not correspond to the technically sound ones. In essence these are used for "forcing out" as large a quantity of material resources as possible.

Thus, the Minsel'khoz mash [Ministry of Tractor and Agricultural Machine Building] overstated the consumption rate for rolled ferrous metals for the T-130 tractors from 7 to 30 percent, for the T-330 by 24 percent, for the T-25A tractors by 22-27 percent, and for the D-21A and D-144 engines by 12 percent. The USSR Ministroy materialov [Ministry of Construction Materials Industry] increased the consumption rate for cement and ferrous metals for producing reinforced concrete and pressure-water pipe by almost 55 percent. The USSR Minenergo [Ministry of Power and Electrification] submitted metal consumption rates for producing the reinforced concrete supports of power transmission lines that were 1.8-fold greater than the figures given in the technical specifications.

Such norming substantially distorts the data on the demand for material resources. In our view, it would be advisable, with the existing situation, to view the overstated consumption rates as padding and eye-wash with all the consequences ensuing from this.

As is known, in recent years, for reducing material expenditures the enterprises have been given quotas for the average reduction in consumption rates for rolled metals, cement, fuel-energy and other resources. However, some of them, in having inflated consumption rates, with the existing accounting procedures fulfill these quotas, in doing nothing to save materials. Having reduced the overstated consumption rates by several percent, the enterprises report a supposedly obtained savings. Such a practice unconditionally does not help to improve work

in the area of the rational utilization of material resources. The data on the accounting for the savings obtained by reducing expenditure standards differ significantly from the actual savings against the proportional expenditures. For certain ministries the difference reaches tens of thousands of tons.

Unfortunately, there still is not a uniform, clear procedure in setting the quotas for savings and accounting for their fulfillment. In some instances the quotas are set for an average decline in the consumption rates in comparison with a base (1980) year, and in others with the year preceding the planned. Moreover, additional quotas are set for savings and these do not consider the reduction in the consumption rate at all. At times, it is even hard to determine the volume of a quota for a planned year. For furnace-boiler fuel, electric and thermal power, in the plan for the current year, for example, there is an overall savings in absolute terms which includes the amount of savings in these resources due to the average reduction in the standards in comparison with 1980 and a quota for an additional decline in consumption.

Such a procedure for determining the amount of the quotas for the savings of energy and fuel as well as the evaluating of their fulfillment in the year being planned, in comparison with the previous year, each time require special calculations, this complicates control over the fulfilling of the quotas and does not reflect the true state of the work in the fulfillment of the socialist obligations for savings adopted by the republics, krays and oblasts. Thus, the quota for the saving of thermal energy during the current year, in being calculated in comparison with the standards of the previous year, is 40.1 million gigacalories in comparison with the actual proportional expenditures of 22.1 million gigacalories.

In setting the quotas in a number of instances the possibilities of the ministries are not studied sufficiently thoroughly and great diversity in the indicators is allowed. For example, the enterprises of the Minedprom [Ministry of Petroleum Industry] overfulfilled the quotas by 8-fold for the total savings in boiler and furnace fuel, including by 76-fold due to the average reduction in the consumption rate. Such indicators cast doubt on the soundness of both the quotas and the accounting of their fulfillment.

For eliminating these shortcomings, it is essential to instill proper order in the setting of quotas for saving resources. It is also essential to see to it that their accounting reflects the actual state of affairs.

In recent years, there has been a positive trend in reducing the material intensiveness of social production. During the Tenth Five-Year Plan, national income used for consumption and accumulation rose by 20.7 percent, and material expenditures by 19.7 percent. As a result, there was a certain decline in the material intensiveness of the national income used for consumption and accumulation. In 1975, for each ruble there was 1.22 ruble of material expenditures, and in 1981, 1.21 ruble. The same trend has been maintained over the first 2 years of the 11th Five-Year Plan. During the first half of the current year, material expenditures declined by more than 1 billion rubles in comparison with the previous year.

An absolute majority of the industrial ministries and departments have kept within the established limits of material expenditures and have reduced the material intensiveness of the produced product. This to a significant degree positively characterizes the work in the area of the rational and economic use of material resources in the national economy.

At the same time, there are opportunities for the more economic management of the economy. A number of ministries during the first half of the year did not keep within the established limit of material expenditures. These included the USSR Minchermet, the Minenergomash [Ministry of Power Machine Building], Minudobreniy [Ministry of Mineral Fertilizer Production], the construction and other ministries. This shows that they have not taken sufficient measures for the rational and economic use of raw products, material and fuel.

In increasing the efficiency of social production, a special place is held by the economic use of the produced materials, and primarily the putting of above-norm and unused material resources into circulation. The planning and economic bodies have done definite work in this area. The ministries and departments have been given quotas for accelerating the turnover rate of working capital and for reducing the above-planned inventories. Control by the USSR Gosplan, the people's control bodies and the financial and banking institutions has been strengthened over the use and safekeeping of raw products, materials, fuel and equipment.

At the same time, the results of economic activities over the years of the Tenth Five-Year Plan and the first 2 years of the 11th Five-Year Plan show that a fundamental change has not come about in reducing material stocks. A significant amount of resources lies frozen at the enterprises and construction projects in the form of above-planned stocks of various materials and uninstalled equipment.

For the Tenth Five-Year Plan, a quota was set to put material resources into economic use by accelerating the turnover rate of working capital and reducing the above-planned stocks of uninstalled equipment. However, this quota has remained unfulfilled. Instead of an acceleration there has been a slowdown in the turnover rate of working capital and the stocks of uninstalled equipment have increased in capital construction. This has necessitated the additional involvement of material and financial means.

The situation has not improved during the first 2 years of the 11th Five-Year Plan. Moreover, the proportional amount of the stocks of material resources in the accumulation fund has been growing more rapidly. While in 1980, the figure was 13.4 percent, in 1981 it was 16.8 percent and last year 22.6 percent. The same level has been maintained this year.

In previous years of the current five-year plan, many ministries have not only not reduced inventory but, on the contrary, have allowed them to grow. For example, with a quota of putting 28 million rubles of above-plan inventories into economic use, the USSR Minenergo has allowed these to rise by 40 million rubles.

A number of ministries have set clearly understated quotas for their subordinate enterprises even when these enterprises have had significant above-plan

stocks, and in certain instances have not given any quotas at all. Workers from the same USSR Minenergo did not plan to put any stocks at the GRES No 19 (the town of Kirishi) into economic use, although on 1 January of the current year the above-norm balances were almost 43 million rubles at this enterprise.

It must be directly said that a clearly bad situation has developed with the material stocks. The reason lies in shortcomings in organizing and carrying out material and technical supply, the overstating of orders for the delivering of resources by the enterprises and organizations, the changing in production programs during the planning period without adjusting the supply plans, violations in a number of instances of delivery dates and completeness by suppliers, the failure of enterprises to observe the stock norms and the stockpiling of resources without considering the real possibilities of processing.

Many enterprises and organizations have been irresponsible not only in terms of the use of raw products, materials, fuel and equipment, but also their storage, allowing instances of mismanagement. This causes great harm to the national economy. Thousands of tons of metal and cement, many other materials are irretrievably lost and a significant amount of equipment is broken up.

It is essential to constantly increase the responsibility of the managers, engineers, technicians and all employees for the rational and economic use of material resources, to achieve high effectiveness in their consumption and economic use and not allow mismanagement and waste. The activities of the labor collectives should be assessed without fail considering their contribution to the saving of resources and on this basis to increasing the efficiency of social production.

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10272

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RESOURCE UTILIZATION AND SUPPLY

PRICING METHODOLOGY FOR SECONDARY RAW MATERIALS REVIEWED

Moscow PLANOVYE KHOZYAYSTVO in Russian No 12, Dec 83 pp 48-53

[Article by V. Novikov and I. Lipsits: "Improving the Methodology and Methods of Pricing Secondary Raw Materials"]

[Text] Secondary material resources have been more and more widely drawn into material production in recent years. Their significance as a source of raw material resources is growing as a result of the increasing scarcity of primary raw materials and their higher recovery costs. The urgency of utilizing secondary raw materials is also determined by the fact that their recycling helps to resolve ecological problems and reduces environmental protection costs.

Secondary material resources are presently used to produce approximately 50 percent of the steel (including saleable scrap) and 22 percent of the paper and cardboard. As much as 78 percent of the blast furnace slag is used in the production of construction materials. Approximately 665,000 tons of textile scrap--roughly 27 percent of the nation's textile consumption--are recycled.

The use of secondary material resources produces a significant economic effect. For example, every ton of waste paper used in the production of paper and cardboard saves 4 m³ of commercial timber. Every ton of slag produces an economic effect ranging from 4 to 11 rubles. Every cubic meter of recycled wood scrap means a saving of roughly 14 rubles.

The decree of the USSR Council of Ministers "On Measures for the Further Improvement of the Utilization of Secondary Raw Materials in the National Economy" and the decree of the CPSU Central Committee and USSR Council of Ministers "On the Intensification of the Effort to Make Economical and Rational Use of Raw Materials, Fuel, Energy and Other Material Resources" call for improvement in the economic mechanism in the direction of offering greater motivation for the rational utilization of material resources.

The most important measures in this area are:

--the inclusion of the section "Utilization of Secondary Raw Materials" in state plans at all levels as of 1981. This section's indicators pertain both to the procurement and recycling of secondary raw materials

characterize the development of the production base for recycling these raw materials. This is the basis for the further improvement of the system for planning the recycling of secondary material resources, which presupposes the development of material balances for roughly 30 of the most important types of waste;

--the institution of state accountability regarding the amount of waste resulting from the processing of primary raw materials (1982);

--the centralization of research and development work on the recycling of secondary resources on a national scale by vesting the appropriate authority in the All-Union Research and Development Institute for Secondary Resources (VIVR) of the USSR State Committee for Material and Technical Supply.

A study by the USSR Central Statistical Administration and USSR Gosstat of the existence, formation and utilization of solid production wastes and the sources (production processes) of their formation in various branches of the national economy (as of 1 January 1981) was an important measure in improving the utilization of secondary material resources. We believe that the study's findings (that are the basis on which the balances are being compiled) should be used to expand the list of secondary material resources and that the balances should divide certain secondary material resources (the direction of utilization is clearly defined) into categories as is done in the case of mineral resources.

This would allow a more objective approach to the problem of how best to strengthen the raw materials base in a given planned period--whether to work the primary deposits or else to expand the recycling of the waste that forms in considerable quantity in many branches.

However, it is our view that better planning and the activation of large production capacities for waste recycling must be supplemented by measures to improve economic incentive and pricing methods.

At the present time, there is no single set of methods for pricing secondary raw materials. Guidelines on the Procedure for Establishing Wholesale Prices on Industrial Waste, which were ratified by the USSR State Committee for Prices in 1975, constitute the most general document.

Practical experience gained in pricing waste in various branches of industry during the time the Guidelines have been effect shows that the methodological principles contained in them makes it possible in a number of instances to establish prices that stimulate the recycling of secondary material resources. At the same time, some points in the Guidelines need to be improved further.

First, they do not provide a clear economic classification of various products. As a result, in some cases two different price levels are assigned to one and the same type of secondary raw material. For example, one price level might equate waste paper with the primary raw material that it is intended to replace while another might downgrade it owing to the loss of some of its consumer properties. The same also applies to certain types of junked metal which can either be used immediately in the

production of a product or else classified as scrap. Second, they do not consider the cost-accounting, economic effectiveness of recycling and the consequently lack precise criteria for evaluating the degree to which waste has lost its consumer properties compared with primary raw materials; the customer is not sufficiently motivated to use secondary raw materials and the prices do not reflect the national economic effect resulting from their use. The Guidelines specify methods for pricing waste that is interchangeable with primary raw materials and do not provide for the establishment of purchase and wholesale prices on secondary raw materials.

The pricing of secondary raw materials is based partly on the price of the primary raw materials they replace and on the additional costs of their recycling.

Practically speaking, the economic effect of substituting secondary for primary raw materials goes to the enterprise that utilizes the waste and to the procurement organization. The result of this is that the purchase price does not reflect the actual cost of the enterprises and the procurement organizations in collecting waste and preparing it for use. The result is that waste procurement is unjustifiably profitable or, conversely, is marginal or even unprofitable to the customer, even though the recycling of this waste is advantageous from the national economy's standpoint.

The further improvement of pricing of secondary raw materials requires the resolution of certain theoretical questions. There is still disagreement on whether productive waste [otkhody proizvodstvennogo potrebleniya] has value (the general consensus is that nonproductive waste does not have value). Opposing points of view are expressed regarding the question whether productive waste has value.

The formation of waste under existing conditions is a function of the existing technological level and is an undesirable factor. Social labor is a process that is directed toward the creation of products rather than waste materials. Accordingly expenditures of socially necessary labor cannot be classified in the same category as waste and hence waste does not have value. Nor does unutilized waste have social use value. But if recycling becomes technically and economically feasible, waste will acquire social use value; however, even then its value is determined only by the socially necessary expenditures on its collection, procurement and processing (if necessary).

The decree of the CPSU Central Committee and the USSR Council of Ministers "On the Intensification of the Effort to Make Economical and Rational Use of Raw Materials, Fuel, Energy and Other Material Resources" outlines an effective system of measures for stimulating production based on waste materials. In our opinion, the enterprises that are the sources of waste materials must also be given more incentive to dispose of them, to improve their quality, to see to it that they are properly warehoused and preserved.

The basic directions in improving the methodology of pricing secondary material resources are: seeing to it that the prices more completely reflect recycling costs and the economic effectiveness of their recycling

to the national economy; to use prices as an additional incentive to collect, deliver and improve the quality of the secondary raw materials that are being disposed of; to dispose of or process waste; to stimulate higher quality of secondary raw materials prepared at procurement enterprises and shipped on for further processing, and to stimulate their use in more effective directions.

The pricing of secondary raw materials that replace primary raw materials must be based on the cost-accounting effect and the economic effect to the national economy from the use of secondary material resources and on the cost of their collection and procurement.

The existence of a cost-accounting economic effect is evidence that given the existing cost of collecting and preparing secondary raw materials for sale and given a normal profitability for these operations, their processing is also profitable to the user.

The cost-accounting economic effect that accrues to users of secondary raw materials should be distributed between them and the suppliers of the secondary raw materials (the enterprise where the secondary material resource formed and which, after preparing it, sold it in the form of secondary raw materials, or the procurement organization that collected the waste and, after preparing it, sold it as secondary raw materials).

At the present time, the amount of the material reward for collecting and selling secondary raw materials, which are as a rule listed by specialized procurement organizations, depends on the fulfillment of the plan and the sales volume in value terms. Under these conditions, higher prices for secondary raw materials have a direct impact on the size of bonuses paid for waste paper, broken glass and certain other types of raw materials.

In order that the wholesale price might offer a greater incentive to collect and prepare waste for sale, it should contain an incentive markup for certain types of waste and should be paid into the economic incentive funds of the enterprises that are the source of the secondary resources.

We believe that the incentive markup should be instituted in the wholesale prices on secondary raw materials that are not listed by procurement organizations and that are sold directly to other enterprises. This would primarily apply to waste that forms at enterprises in the raw material branches of industry.

Markups in wholesale prices on waste should be instituted if there is a genuine, appreciable economic effect. Accordingly they should comprise at least 10 percent of the price of the secondary raw material, which takes into account the cost of collecting and preparing it for sale as well as the normative level of profitability based on this cost. Possibly the markups should be included in the sale price of the waste.

There must be a differentiated approach to the calculation of the economic effect in the wholesale price. It should to a greater degree be included in prices on types of secondary raw material that are valuable to the national economy if the cost of their procurement and preparation for sale comprises an insignificant share of the primary raw material they replace.

The economic effect should also be included to a greater degree in the procurement price when the cost of collecting and preparing secondary raw materials fluctuates significantly from one source enterprise to another; this will assure their profitability from the sale of waste.

In distributing the economic effect of recycling between supplier and user, it is also expedient to consider the recycling factor which is calculated as the ratio of the volume of recycling to the amount of a given type of waste that forms in a year's time (such an approach is recommended, for example, in pricing guidelines regarding waste in the chemical industry). The share of the effect that goes to the supplier will grow in direct proportion to the growth of the recycling factor. Such a method provides an economic incentive to both users and suppliers of waste materials.

However, on the whole the economic effect in the price should as a rule not be more than 70-80 percent of the estimated total.

In some cases the utilization of secondary raw materials is not economically feasible from a cost-accounting standpoint, i. e., their potential use does not offer a cost-accounting economic effect. A graphic example is the problem of recycling waste in the potassium industry. Since the current pricing methods cannot interest Uralkaliy and Beloruskaliy to utilize and dispose of this waste, it is piled up on the earth's surface to the considerable detriment of the national economy. Under such conditions, the economic effect to the national economy must be considered.

Economic analysis shows that the national economy realizes an effect (in production, transport and ecology) when secondary material resources are drawn into the raw materials cycle. In production, this effect originates when secondary material resources are recycled since this means the relative lesser volume of recovery or production of the primary raw material, lower transport costs, and additional profit for the national economy.

The ecological effect, which results from the diminishing pollution of the environment with unreclaimed waste, acquires great importance. It in turn is formed from other effects: from the reduction in the amount of land taken up by enterprises engaged in the extraction of the primary raw material replaced by the secondary material as well as land that is used to store the waste resulting from the extraction of the primary raw material and secondary material resources; from the smaller measure of water pollution by liquid production waste or the infiltration of hazardous substances from stored waste resulting from the processing of primary raw materials and secondary material resources; from the reduction of air pollution with gases, dust and harmful matter from waste dumps.

The Temporary Methods for Determining the Economic Effectiveness of Outlays on Environmental Protection Measures can be used to calculate the magnitude of these effects.

In our opinion, the existence of a national economic effect is very weighty proof of the feasibility of recycling a given type of secondary resources. But the question arises as to how to coordinate the cost-accounting interests of suppliers and users of secondary raw materials in the pricing

process. There are two possible ways of resolving this contradiction. The first is to establish wholesale prices for waste that goes directly to the user based on the principle of minimum benefits from the use of secondary raw materials. The cost of collecting and disposing of secondary raw materials will be higher than wholesale prices and the difference between them can be compensated by subsidies from the state budget. But in our opinion the use of these payments is undesirable both because they have little incentive value and because of the inevitable attendant increase in the complexity of financial relations in the national economy.

We consider it acceptable to follow another path: to stimulate the recycling of waste by means of net output norms. In the given instance, the wholesale price on secondary raw materials is also calculated in a way that ensures a minimum benefit from the use of secondary raw materials compared with primary raw materials. This entails the use of the minimum benefit coefficient which can be taken as equal to $(1 - E_H)$, where E_H is the normative coefficient of the effectiveness of capital investments established for the branch that uses secondary raw materials.

The difference between the wholesale price and collection and sales costs must go to the supplier of secondary raw materials (to the enterprise where they formed) in the form of an incentive markup in normative net output for this type of secondary raw material or waste. Given the present planning and economic incentive mechanism, higher net output norms for secondary resources will have a quite appreciable impact on the economic indicators of enterprises that are the sources of secondary raw materials especially if the unprofitability of outside sales of secondary raw materials or waste is taken into account in the plans.

At the same time, the establishment of incentive markups in net output norms will not lead to fictitious net output in the national economy since they will be based on the same increase (prevention of loss) in society's net income that is attained as a result of the recycling of secondary raw materials. The establishment of incentive markups in net output norms on secondary raw materials does not contradict the existing guidelines on normative net output questions since these guidelines only apply to products made from primary raw materials. Guidelines must be developed for determining net output norms for secondary raw materials and products made from them. Some branches have already amassed a certain amount of experience in developing net output norms for waste materials.

Certain types of secondary raw materials cannot be considered to be directly interchangeable with primary raw materials. Nonetheless, the products made from them may be interchangeable with products made from primary raw materials or they may be used to produce products that have distinct economic features in the process of their subsequent use. Specifically, when there is a shortage of certain types of products made from primary raw materials, the requirements of some spheres may be satisfied by products made from secondary raw materials even if they cost more. At the same time, the use of these products is economically beneficial to the national economy. Such a situation developed, for example, in the case of plastic pipe made from secondary raw materials.

If products made from secondary raw materials are interchangeable with products made from primary raw materials, the price level on the secondary resources should take the effectiveness of such replacement into account. If there is cost-accounting or national-economic economic effectiveness, it must be reflected in price in a way analagous to the direct interchangeability of primary and secondary raw materials.

Prices on secondary raw materials must also be more closely coordinated with technical norms. However, they still do not sufficiently reflect the qualitative characteristics of secondary raw materials and this limits the possibility of using prices to stimulate improvements in the quality of secondary raw materials.

FOOTNOTES

1. V. Ksintaris, "The Use of Secondary Material Resources in the National Economy," *PLANOVOYE KHOZYAYSTVO*, No 6, 1979.
2. See: *PRAVDA*, 12 May 1981.
3. *EKONOMICHESKAYA GAZETA*, No 33, 1980.

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INTRODUCTION OF NEW TECHNOLOGY

ECONOMIST TRACES IMPACT OF TECHNOLOGY ON PRODUCTION

Moscow PLANOVoye KHOZYAYSTVO in Russian. No 1, Jan 84 pp 114-119

[Article by G. Danilin, candidate of economic sciences: "The Distinctive Features in the Development of Production Forces Under the Conditions of the Scientific and Technical Revolution"]

[Text] Production forces are the organic unity of production means and people -- social production workers who possess certain knowledge and production and technical experience and who use the tools, resources and objects of labor for the creation of material and spiritual blessings. V. I. Lenin wrote: "The primary production force of all mankind is the worker, the laborer".¹ As a system of subjective (man) and technical (article) elements, production forces serve as an instrument for man to influence nature during social production.

The economics of developed socialism rely on highly developed production forces, on a powerful and advanced industry, and on a large-scale and highly mechanized agriculture, which is founded on collective principles.

The modern production forces of the USSR are an enormous production fund. On 1 January 1983, they were equal to 1.968 trillion rubles; they were a multi-million-strong army of workers, kolkhoz members and employees with a high cultural and educational level composed of 128,300,000 people. The arming of labor with production resources has reached large dimensions; in particular the electrical power supplied per job in industry increased 7.4-fold in 1982 when compared with 1940, in agriculture -- 28.3-fold, and in construction (the machines supplied per job) -- 26-fold.

The growth in the power supply per job and in the educational and cultural level of the workers and the revolutions in technology were the main factors in increasing labor productivity as the decisive condition for the victory of the new social system. Compared with 1940, labor productivity grew 8.1-fold in industry during 1982, 6.7-fold in construction, and 4.2-fold in agriculture. During the present stage in our country's development, production forces are performing one of the main tasks of the state of all the people--the construction of the material and technical base for communism. Its solution will insure an abundance of material and spiritual blessings, the most complete development of each worker's creative capabilities, and the formation of a communist-type worker.

By the beginning of the Eighties, "The production forces of Soviet society had achieved a qualitatively new level. The scientific and technical revolution is spreading deep down and wider, and the appearance of many plants and entire branches is changing." ² In accordance with the policy that was developed by the 25th and 26th CPSU congresses for the intensification of social production, the scope of using the achievements of science and technology in the national economy has grown. Scientific and technical cooperation with the countries of the socialist commonwealth is expanding.

As is pointed out in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures To Accelerate Scientific and Technical Progress in the National Economy", however, the management of scientific and technical progress still does not completely satisfy the task which was posed by the party of uniting in fact the advantages of our socialist system with the achievements of the scientific and technical revolution. This question is acquiring special importance in view of the fact that the development of science and technology has become one of the main avenues of competition between the socialist and capitalist systems. The persistent realization of the achievements of the scientific and technical revolution will permit profound qualitative changes to be made in production forces and an improvement of production relationships, which corresponds to this, to be carried out. In its turn, this will insure the solution of the main task in the economic area -- a cardinal improvement in labor productivity. Yu. V. Andropov, general secretary of the CPSU Central Committee, pointed out in his speech during the June 1983 plenum: "Under the conditions of the scientific and technical revolution, this task has now acquired special significance -- both for our internal organizational development and in an international regard". ³ The main way for a qualitative transformation of production forces is "a shift to an intensive development and the combining in fact of the advantages of our socialist system with the achievements of the scientific and technical revolution -- with those of its latest stage which promises a technological revolution in many spheres of production". ⁴ Decisive importance in this work is being allotted to the implementation of a unified scientific and technical policy.

What are the distinctive features in the development of production forces during the present stage?

People are developing and using equipment for the most varied purposes: Obtaining, transmitting and converting energy; influencing the objects of work when obtaining material and cultural blessings; producing natural and artificial materials; collecting, storing, processing, and transmitting information; researching the laws and phenomena of nature and society's development; migrations; communications; services; living conditions; health care; culture; sports; developing the mineral wealth of the earth, the ocean and space; and providing for defense. Among the variety of technical systems, the decisive role belongs to production equipment since people create all the other technical systems with its help.

As K. Marx pointed out, production equipment and "machines are the most powerful resources for increasing labor productivity ...". ⁵ V. I. Lenin expressed

a similar thought: "The success of labor is increased many-fold by using machines...".⁶ The property of machine implements of labor to be a powerful means for increasing labor productivity predetermines their role as the most important element of production forces.

The Industrial Revolution, which began in England 200 years ago, marked the beginning of the mass intrusion of machine equipment between man and nature. The evolutionary process of gradually accumulating small quantitative changes in the form of increasing all of their parameters: dimensions, speed, speed of response, capacities, accuracy, temperature, pressure, electrical voltage, etc., was the most characteristic feature in the development of work implements during the 200-year history of machine and factory production. One of the first sewing machines, which was invented by E. Howe (1845), made 300 stitches a minute. Modern sewing machines make 3,000-3,500 stitches. The average speed of cutting metal with the basic type of metal-cutting equipment-- lathes-- increased from 2.8 meters a minute in 1885 to 11.5 meters a minute in 1913 and from 69.0 meters a minute in 1940 to 115 meters a minute in 1965. The maximum operating speed of paper-making machines was 10 meters a minute in 1830, 530 meters a minute in 1950, and 820 meters a minute in 1975.

The speed of modern automatic multispindle machines reaches 2,500 revolutions a minute when handling only nonferrous metals. When handling the same items made of steel (these are 98.5 percent of all items processed), the maximum speed reaches only 300-700 revolutions of a spindle per minute. Shock is one of the most widespread technological techniques in machine building on whose basis forging and stamping machines operate. The mechanical shock exhausts its potential. At the present time, approximately 80 percent of automobile and aircraft items are forged and stamped.

The natural process of replacing technologies is objectively growing in production: a shift to the use of different types of non-mechanical technologies in direct treatment processes. Work implements of new quality are being created. With their use, the form, condition and position of the work object are being changed under the influence of the energy of intermolecular, intramolecular, atomic and subatomic bonds.

The use of non-mechanical types of technologies permits the duration of the technological cycle to be decreased sharply, expenditures of energy and labor to be curtailed quite a bit, the accuracy of the processing and the strength of the items to be increased significantly, and qualitative improvements in the productivity of the equipment to be insured. In the knitting industry, for example, ultrasound assemblies, which permit several intermediate operations to be eliminated and which speed up twofold the sewing of items, are being introduced for the serial production of items with threadless seams. Along with the traditional textile plant, the non-cloth material industry, which possesses a number of advantages: a fewer number of technological operations, high productivity of equipment, the complete use of raw materials, the opportunity to create materials with earlier designated qualities, and savings in fuel and energy resources, is being expanded more and more. While 10 square meters

of cloth are produced per hour on the best shuttle loom, the output of non-cloth linen using the knitting-knitting method reaches 100-150 square meters and using the needle penetrating method -- 50 square meters.

Modern equipment requires the wide use of highly alloyed steel and hard alloys as well as such strong materials as silicon, germanium, ferrites, rubies, diamonds etc. The majority of such materials completely or almost do not lend themselves to processing using the traditional mechanical methods. Non-mechanical technology has come to the aid. For example, the use of lasers to drill openings in diamond dies decreases the processing time from two days to two minutes, i.e. 1,500-fold. The metal mold of an automobile tire casing is formed 30-fold faster using an electroerosion machine rather than a standard milling machine. The cutting of milled rolls takes 90 minutes instead of 1,000-1,500 minutes using a mechanical method. Electrochemical methods of processing metals insure a 5-10-fold increase in the productivity of metal-processing equipment, and operations, which cannot be performed by other methods are performed with their help. The efficiency of these methods is more than 80-90 percent.

The explosion is coming to replace mechanical shock. It crushes mountain rocks; moves dirt; stamps, warms and compacts metals; welds them; synthesizes new materials, etc. The use of a shock wave as a work implement permits pressure to be raised to 10 million atmospheres, and temperature -- to tens of thousands of degrees.

The replacement of mechanical technologies with non-mechanical ones, being a specific feature in the development of production forces during the age of the scientific and technical revolution, is the basic direction for improving work implements and systems. The main motivation for this is not the subject of a subjective selection or preference but an objective tendency which has been engendered by the appearance of "non-technological materials" which do not lend themselves to treatment using traditional methods. The opportunities for increasing the quality of these materials not only in improving their design and improving the properties of the initial materials but also in the use of fundamentally new methods for processing them.

An important trend in modern social production -- the creation of universal work implements and integrated automated plants which function on the basis of combining different types of technology, including non-mechanical. The objective capability of this lies in the very nature of non-mechanical types of technology. Work implements, which are based on its use, possess universal application, i.e., they are capable of acting on any work object and performing the most varied technological functions and operations. For example, industrial lasers can process plastics, metals, wood, paper, and other materials and perform cutting, drilling, welding, soldering, and hardening operations. A laser ray easily welds with glass and ceramics and steel with copper, beryllium, titanium, and different alloys. Control devices are being developed based on lasers. Ultraviolet is being used for joining plastic items, cleaning the surfaces of molds, controlling the quality of welded seams, detecting defects in materials, drilling, cutting, milling, grinding, polishing and cutting.

male and female threads in such hard materials as glass, ferrites, quartz, zircons, rubies, sapphires, oxides, beryllium, etc.

In traditional plants, for example, in machine building, the trend toward the production of universal work implements is being displayed in the creation of processing centers -- automated machine tool lines which are controlled by electronic computers and which consist of machines with a programmed control. Multi-manufacture machine tool lines are especially effective in enterprises with a universal type of production which is characterized by a wide range of products, the processing of items with tens of thousands of standard sizes, small serial production, and instability in production programs. These lines insure flexibility in the technological process and the capability of simultaneously processing items with different names and different configurations which go into production in an arbitrary amount and in a haphazard sequence. For example, the processing center, which is produced by the Lenin-grad Machine-Tool Association imeni Ya. M. Syrdlov, is equipped with 50 types of instruments each of which can perform several operations: milling, cutting, drilling, counter-sinking, cutting threads, etc.

In metallurgy, the development of universal work machines is becoming possible based on automating the control of the technological process. In the Nizhnesergolovsk Metallurgical Plant (Sverdlovsk Oblast), a "250" milling machine, which is controlled by an electronic computer, produces rolled product with a complicated configuration of 130 shapes; the switching from one item to another is accomplished in 20 minutes all told.

As a rule, such universal work implements and technological processes are oriented toward similar work objects (raw materials). In those cases where the raw material has a multi-component composition (mineral resources, oil, coal, etc.), integrated plants and enterprises, which allow the combining of several formerly specialized plants into a single technological stream, are being created. The distinctive features of these enterprises are the use of multi-component raw material, the combining of different types of technologies, automated control of the technological processes, and the output of multi-manufacture products. Raw material is being used thoroughly in many nonferrous metallurgical enterprises: 12 basic and 62 incidental elements are extracted from mineral resources, and the incidental obtaining of silver is being completely assured. In Kazakhstan's nonferrous metallurgical enterprises, elements with about 50 names are being extracted from multi-metal ores. In the Dniepropetrovsk Combine, the completeness of using lead ore exceeds 98 percent, and the incidental production, expressed in costs, is half of the overall production volume.

Scientists link the beginning of the new era in metallurgy with the use of plasma furnaces for smelting highly alloyed steels. Whereas the maximum temperature is 1,600 °C in traditional smelting equipment, the temperature reaches 15,000 °C in a plasma furnace. This concentration of heat energy accelerates a great deal and improves the production process. A plasma furnace works without smoke, dust and noise; and it does not dirty the environment. The degree of assimilation of expensive metals (chromium, manganese, nickel, molybdenum, and tungsten) reaches almost 100 percent since the smelting takes

place in an inert environment. The assembly can produce a wide nomenclature of the highest types of steel with a low carbon content.

The erection of universal and integrated plants permits the initial raw material to be completely used, a broad nomenclature of products without wastes to be produced, and pollution of the environment to be avoided.

The noted features in the development of production forces -- the creation of non-mechanical work implements, the replacement of technologies, the automation of controlling production processes, and the creation of universal and integrated plants based on the latest types of technology -- are a component part of the content of a socialist state's scientific and technical policy during the age of the scientific and technical revolution. They form the strategy for the technical re-equipping of production and the intensification of the economy during the period of constructing communism's material and technical base. The essence of this strategy is the creation of machine implements and machine complexes based on non-mechanical technology combined with automated operations and the development based on this of universal and integrated waste-free technological processes in order to assure the repeated growth of equipment productivity, production capacities and the productivity of social labor.

The distinctive features in the development of a socialist society's production forces are displayed in management practices and in the results of the conscientious activity of people whose attitudes are shaped by socialist property. In the final analysis national ownership of the means of production objectively predetermines the necessity and capability of a socialist state to pursue a single scientific and technical policy.

Since it is a state, unified and centralized policy that is carried out in a planned manner, a scientific and technical policy under socialism is primarily aimed at transforming the system of production forces in a revolutionary and qualitative manner, beginning with its key element -- the work implement. The priority development of the latest work implements and types of technology is a natural trend in the development of production forces during the age of the scientific and technical revolution.

The documents of the 25th and 26th CPSU congresses and the decisions of the November 1982 and June 1983 CPSU Central Committee Plenums provide for a cardinal increase in labor productivity based on the widespread and accelerated introduction of the achievements of science, technology and progressive experience into practices; and by combining the advantages of the socialist system with the achievements of the scientific and technical revolution. This is manifested primarily in the development of the leading branches.

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures To Accelerate Scientific and Technical Progress in the National Economy" signifies a new stage in the carrying out of the Soviet state's scientific and technical policy. This stage will be characterized by a significant increase in exactingness and responsibility for the fulfillment

of the plans and tasks for developing science and technology. Their tasks now include a number of very important indicators in accordance with which the rating of the results of the collective's economic activity is primarily made and the results of socialist competition are summed up. In order to increase the influence effect on accelerating the development of new equipment and technologies, the decree provides for the further development of the network of large associations and enterprises and the concentration of the potential of scientific, research, design and technological organizations on solving the tasks which insure the satisfaction of both the current and the long-range requirements of the national economy. The expansion of the practice of organizing in associations and enterprises temporary scientific and production subunits for the most important national economic problems and similar collectives of an inter-branch nature has been recognized as being advisable. It is planned to carry out a series of measures aimed at the accelerated establishment and technical equipping of test and experimental bases and plants. The creation in 1984 of reserve capacities for the preparation of plants and the mastery of the output of new types of equipment and materials is being planned.

The program special purpose method for planning the development of science and technology will receive further development. Beginning with the 12th Five-Year Plan, all-union, republic (inter-republic), branch (inter-branch), scientific and technical programs for regions and territorial production complexes, whose basic tasks will be included in the plans, will be developed.

The CPSU Central Committee and the USSR Council of Ministers have determined that the widespread automation of technological processes based on the use of automated machine tools, machines and mechanisms; unified equipment modules; robotic sets; and computer equipment, is one of the main avenues in the work to accelerate scientific and technical progress. All-union work programs in the area of creating flexible automated plants and their introduction into the national economy are being drawn up for these purposes.

The development of differentiated norms for periods to update the basic types of machine building products is being planned. Beginning in 1986, quotas for the production of new and the modernization of existing types of machines, equipment and instruments and quotas for removing obsolete machine building products from production will be determined in state five-year and annual plans based on them. The certifying of industrial products based on two categories of quality -- highest and first -- is being introduced in 1984. Items, which have not been certified according to these categories, are subject to removal from production.

The need for the timely realization of drafts that are being carried out based on international agreements and for improving the work in using the achievements of the CEMA member countries in the area of science and technology was pointed out to ministries and departments.

The realization of these and the other measures, which are contained in the decree, will permit industry's output of goods, which satisfy the best modern

examples according to their indicators, to be assured in the very near future; progressive technological processes to be introduced; and labor productivity in the national economy to be raised considerably on this basis. In its social development, our country has arrived at an historical frontier where deep qualitative changes in production forces have not only matured but have also become objectively unavoidable. Yu. V. Andropov pointed out in his speech during the June 1983 CPSU Central Committee Plenum: "A unified scientific and technical policy is now acquiring decisive importance. Enormous work awaits us in the development of machines, mechanisms and technologies both for today and for tomorrow. It is necessary to automate production and to insure the widest use of computers and robots and the incorporation of flexible technologies which will permit production to be rapidly and efficiently switched over to the manufacturing of new products. The future of our power is primarily the use of the latest nuclear reactors and the practical solution of the problem of controlled thermonuclear fusion in the future. Such tasks as the obtaining of materials with properties that have been set in advance, the development of biotechnology, and the widespread use of waste-free and energy-saving technologies in industry, are on the agenda. All of this will lead to a genuine revolution in our national economy".

Production forces have reached enormous dimensions in the USSR. Profound qualitative changes are occurring in them. Under the conditions of improving production relationships, production forces are receiving a new stimulus for their development, their more rational siting on the country's territory, the improvement of the national economic structure through the rapid development of branches that determine scientific and technical progress, and the accelerated development of the country's eastern regions by involving the rich natural resources in the economic turnover and their effective use as the main avenue for augmenting the country's national wealth.

FOOTNOTES

1. V. I. Lenin, "Polnoye sobraniye sochineniy" [Complete Works], Vol 38, p 359.
2. "Materialy XXVI s"yezda KPSS" [Materials on the 26th CPSU Congress], Moscow, Politizdat, 1981, pp 31-32.
3. "Materialy Plenuma Tsentral'nogo Komiteta KPSS 14-15 iyunya 1983 goda" [Materials of the 14-15 June 1983 CPSU Central Committee Plenum], Moscow, Politizdat, 1983, p 9.
4. Ibid., p 10.
5. K. Marx and F. Engels, "Sochineniya" [Works], Vol 23, p 414.
6. Lenin, op. cit., Vol 2, p 90.
7. "Materialy Plenuma..." op. cit., p 10.

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